THE IMPORTANCE OF INFORMATION AND COMMUNICATION TECHNOLOGY IN WOMEN-OWNED BUSINESSES IN KIGALI, RWANDA

by

SIMON NSENGIMANA

Thesis submitted in fulfilment of the requirements for the degree
Doctorate of Commerce in Business and Information and Communication Technology: Business and Information Administration
in the Faculty of Business and Management Sciences
at the Cape Peninsula University of Technology

Supervisor: Prof Visvanathan Naicker

District Six, Cape Town
September 2020

DECLARATION

I, Simon Nsengimana declare that the contents of this thesis represents my own work, and that the thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Signed 14 September 2020

ABSTRACT

The aim of this study is to identify the importance of ICT in women-owned businesses in Kigali. It envisages that integrating ICT in their enterprises can lead to business performance, growth, and sustainability. Therefore, to answer the research questions that drove the study, research questions were formulated to identify the factors that influenced women to engage in entrepreneurial activities in Kigali, Rwanda; the constraints they face; how ICT could intervene to mitigate or solve those constraints, and the role played by stakeholders to support ICT integration among women-owned SMEs in Kigali. The positivist philosophy with deductive reasoning underpinned this study. A quantitative approach was used to collect cross-sectional survey data from 409 women-owned SMEs in Kigali. The respondent were selected purposively. Data were analysed using Statistical Package for the Social Sciences (SPSS) version 26 and Stata version 16. The findings revealed that unemployment was the primary reason for women entrepreneurs launching SMEs. Constraints they experienced included HIV/AIDS, lack of entrepreneurship skills, and lack of market opportunities. However, they did not leverage the Internet enough to challenge the constraints they experienced. But, the cellphone was found to be more useful in their business activities. Interestingly, stakeholders strongly supported the integration of ICT among them by providing training and connecting them to networks via the Internet. This study contributes to the body of knowledge due to covering a gap in using ICT in SMEs. Most studies have focused on Western nations and male enterprises. The few conducted in developing countries such as Rwanda suggest a sustainable need to uncover the necessity for ICT in women-owned businesses in Rwanda and other developing nations. The new model developed is unique. Adding it to the body of knowledge could be used by entrepreneurs to improve their business performance; it could serve as a reference and didactic material in business education and training.

Key words: Business performance**,** cellphone, constraints, push and pull factors, Internet, sustainability, women-owned business, information and communication technology, small and medium enterprises, adoption, and Kigali, Rwanda.

ACKNOWLEDGEMENTS

I wish to thank:

Professor Naicker Visvanathan, my research supervisor, for his patient support, motivation, and advice during my research journey. I felt incredibly fortunate to have a supervisor who cared so much for my research, and who answered my questions and inquiries so effectively.

Cape Peninsula University of Technology family for full support during my research process. The financial assistance of Cape Peninsula University of Technology and National Research Foundation towards this research is acknowledged. Opinions expressed in this thesis and the conclusions arrived at, are those of the author, and are not necessarily to be attributed to the National Research Foundation.

Professor Philip AE Serumaga-Zake for helping with statistical data analysis.

Dr Nereshnee Govender for editing my thesis.

Professor Bouwien Smits-Engelsman and Professor Johannes Cronje for consultation, research material and encouragement.

Sandrine, Jacqueline Kabaharira and Byiringiro for assisting with data collection.

Dr Diana Bell, who helped me to embrace tertiary education, made my dream come true, continuously monitoring my progress and providing constructive advice and encouragement.

My colleagues Ontebetse Patricia Mothopeng, Mbali Zulu, Erenest ETIM, Philemon Nji Kim for collaboration during the research process.

The Library team for professional providing research material and other support

Prof Mugabe Eulalie, Dr Emmanuel Bonney, Stella Elikphim Laertes and Mbonyiryivuze Agnes for sharing research material and experience from different universities. Your collaboration is appreciated.

My friends Nomshongwana Nosipho and Philemon Iryihamije who have always been a significant source of strength when things get a bit depressing. Thank you sincerely for being there for me all the time.

Perpetue Mukayigire, Mandume Kawana, Emanuel Twagirimana, and Manako Nako for the finance and encouragement and support.

Reverend Doctor David C Smith for prayers, encouragement, and love.

My RIP dad, Apollos Munyeragwe, who loves and guides me everywhere I go, and whatever I do, you are the best role model. For my brothers and sisters, you put up with me getting busy and skipping many things. I am truly thankful for your goodness and affection and your appreciation.

My caring and compassionate wife, Françoise Twishimane and my two wonderful children, Melissa Isabel Shimwa and Morane da Silva Ishimwe who provide constant inspiration. Your affection and compassion have guided me through the hard times. Without you believing in me, I would not have accomplished this. It is time to celebrate; along with me, you have won this degree.

God the Almighty, who has granted me the strength, the wisdom, the skill and the capacity to pursue this study and to endure and accomplish it in a satisfactory manner. Such success would not have been possible without his blessings.

All those who supported me in any form during the completion of the project. Their efforts are greatly appreciated.

DEDICATION

I dedicate this thesis to women-owned Small and Medium Enterprises in Kigali, Rwanda who adopted Information and Communication Technology in their entrepreneurial activities.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDIX

GLOSSARY

Cellphone: The cellphone/ mobile phone is a wireless handheld device that is used for verbal communication, writing, and receiving a message, and it can connect to the Internet to perform various social and business activities (Techopedia, 2018).

Constraint: Anything that imposes a barrier that limits a person to achieve what is expected to achieve.

Information and Communication Technology (ICT): Interaction involves hardware and software technologies to process, repeat, interpret, and store information (Freeman & Hasnaoui, 2010).

ICT adoption: ICT adoption takes place when an entrepreneur engages in using technology to improve her/his business activities (Weber & Kauffman, 2011).

Internet: The Internet is about a network of a personal computer or another device that allows the user to send and receive electronic information, for instance, an email (Freeman & Hasnaoui, 2010).

Kigali: Kigali is located almost in the center of the country, and it is the political and economic capital of Rwanda.

Motivation: A motivation defined as an intrinsic force pushing a person to do something (Cherry, 2018).

Small and Medium Businesses (SMEs): According to the World Bank (WB), there is no common definition of SMEs. However, most countries, define SMEs based on a number of employees, capital start-up, and annual income (Ardic, et al., 2011). Rwanda also defines the SMEs centered on Wold Bank criteria. According to Rwanda. Ministry of Trade and Industry (2010) the small and medium business group micro, small, and medium businesses and is characterised by 1-100 workers; capital start-up ranging from less than RwF 500 000 (R 8 824.57; USD 525.77) to RwF 75 000 000 (R 1 323 685.14; USD 78 866.01); and an annual turnover of RwF 300 000 (R 5 294.74; USD 315 464.04) to RwF 50 000 000 (R 882 456.76; USD 52 577.34). However,

meeting two over three criteria qualifies business in the SME category (See Table 1). To have idea on Rwanda currency, the value given above in USA Dollas and South African Rand are at the time the researcher was writing the thesis: USD 1 = RwF 950.98; Rand 1= RwF 56.66.

Table 1 Criteria for Small and Medium Businesses in Rwanda

Size of Enterprises	**Net capital investments (million RwF)**	**Annual turnover over (Million RwF)**	**Number of Employees**
Micro-Enterprise	Less than 0.5	Less than 0.3	1 to 3
Small-Enterprise	0.5 to 15	0.3 to 12	4 to 30
Medium-Enterprise	15 to 75	12 to 50	31 to 100

Rwanda. Ministry of trade and industry (2010:7)

Sustainable business: A sustainable business is an established and stable business. An established business is a venture aged over three and a half years and performs well and grows (Kelly et al., 2017).

Women-owned business: The definition of women-owned businesses varies in different countries. For instance, India and the United States of America (USA) define women-owned business as a female who possesses 51% and over in the company shares (Vazquez, 2011; American Express, 2014:11). However, the British definition attributes 100% ownership to women-owned businesses (Carter & Jones-Evans, 2012). Therefore, Rwanda does not have a definition of women-owned business, but as researcher being an entrepreneur in Rwanda, women-owned business in Rwanda fits better with the British definition than the Indian and USA definition (Carter & Jones-Evans, 2012).

ABBREVIATIONS AND ACRONYMS

ADB	Africa Development Bank
ADB	Asian Development Bank
AGFI	Adjusted Goodness of Fit Index
AI	Artificial Interagency
AIDS	Acquired immunodeficiency syndrome
AIRTEL	Bharti Airtel Limited
AMOS	Analysis of a Moment Structures
ANT	Actor-Network Theory
APEC	Asia-Pacific Economic Cooperation
AU	Africa Union
BDF	Business Development Funds
BI	Behavioural Intention
CAPI	Computer-Assisted Personal Interviewing
CARE	Cooperative for Assistance and Relief
CBD	Central Business District
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CIA	Central Intelligence Agency
CMIN/DF	Chi-square value Minimum
COOPEDU	Cooperative Duterimbere
CPUT	Cape Peninsula University of Technology
DF	Degree of Freedom
DFI	Direct Foreign Investment
DFR	Direct Foreign Investment
DOI	Diffusion of Innovations Theory
EA	Enterprise Application
EAC	Eastern African Community
ED	Entrepreneurial Development
EE	Effort Expectancy
EFA	Exploratory Factor Analysis
EP	Entrepreneurial Performance
FC	Facilitating Conditions
FREC	Faculty Research Ethics Committee
GDP	Gross Domestic Product
GEM	Global Entrepreneurship Monitor
GERA	Global Entrepreneurship Research Association
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GmbH	Gesellschaft mit beschränkter Haftung
GPP	Generation Partnership Project
HIV	Human Immunodeficiency Virus
IBM	International Business Machines Corporation
ICT	Information and Communication Technology
IFC	International Finance Corporation
IFI	Incremental Fit Index
ILO	International Labour Office
IMF	International Monetary Fund
ITC	International Trade Centre

ITU	International Communication Unions
JDN	Journal du Net
KMO	Kaiser-Meyer – Olkin
KS	Kolmogorov Smirnov
LR	Logistic Regression
LTE	Long Term Evolution
MINEACOM	Ministry of Trade, Industry and East African Community Affairs
ML	Maximum Likelihood
MTN	Mobile Telephone Network
NFI	Normed Fit Index
NFNV	New Faces New Voices
NGO	Non-Government Organisation
NGP	National Gender Policy
NICI	National Information Communication Infrastructure
NISR	National Institute of Statistics of Rwanda
OECD	Organisation for Economic Co-operation and Development
OLA	OnLine Access
OLS	Ordinary Least Squares
PC	Personal Computer
PCFI	Parsimony comparative fit index
PCLOSE	p-value for test of close fit
PE	Performance Expectancy
PEOU	Perceived ease-of-use
PGFI	Parsimonious Fit Indices
PNFI	Parsimony Normed Fit Index
PSF	Private Sector Federation
PU	Perceived usefulness
RAMSEA	Root mean square error of approximation
RCA	Rwanda Cooperative Agency
RCWE	Rwanda Chamber of Women Entrepreneurs
RD	Research and Development
RDB	Rwanda Dairy's Board
RDB	Rwanda Development Board
RINEX	Rwanda Internet Exchange
RMSEA	Root Mean Square Error of Approximation
RPA	Rwanda Procurement Authority
RRA	Rwanda Revenue Authority
RSSB	Social Security Board
RURA	Rwanda Utilities and Regulatory Agency
RWAMREC	Rwanda Men's Resource Center
RwF	Rwandan Franc
SACCO	Saving Credits and Co-operatives
SDGC/A	Sustainable Development Goals Center for Africa
SEM	Structural Equation Modelling
SGDs	Sustainable Development Goals
SGR	Standard Gauge Railway
SI	Social Influence
SMEs	Small and Medium Enterprises
SMS	Short Message Service
SPSS	Statistical Package for the Social Sciences

TAM	Technology Acceptance Model
TI	Transparency International
TIGO	Transportable Integrated Geodetic Observatory
TMEA	TradeMark East Africa
TOE	Technology-Organisation-Environment theory
UCT	University of Cape Town
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNESCO	United Nations Education, Scientific and Cultural Organisation
UN-OHRLLS	The United Nations Office of the High Representative for the Least Developed Countries Landlocked Developing Countries and Small Island Developing States
USA	Unites States of America
USAID	United States Agency for International Development
USB	Universal Serial Bus
USD	United States Dollar
UTAUT	Unified Theory of Acceptance and Use of Technology
VAT	Value-Added Tax
VODACOM	Voice Data Communication
VoIP	Voice over Internet Protocol
WB	World Bank
WEF	World Economic Forum
WHO	World Health Organization

CHAPTER ONE
INTRODUCTION AND BACKGROUND

1.1 Introduction

The aim of this study was to identify the importance of ICT in women-owned businesses in Kigali. It envisages that integrating of ICT in their enterprises can lead to business promotion and enhance their ability to compete with male entrepreneurs.

Rahman and Mohammad (2016) state that ICT empowered women entrepreneurs and improved their business in Bangladesh, and they identified new opportunities. Small and medium businesses are known to facilitate the development of society. They generate employment, decrease poverty and mostly lift the living standards of their families and those around them (Edinburgh Group, 2014). Even though they have these lofty virtues, they nonetheless face several challenges. These challenges range from access to finance, high tax rates, high-interest rates, illiteracy, poor business management skills and dilapidated infrastructure (Nsengimana et al., 2017).

The International Finance Corporation (2008) and the Ministry of Trade and Industry (2013) acknowledges that most small businesses confront these challenges, but it is far worse for women-owned businesses. Moreover, there are many reasons for this, including social, economic and cultural barriers. Due to patriarchy and stereotypes coupled with culture, beliefs and religion, womens' access to resources are very limited; they cannot easily obtain a loan to open a business because of lack of collateral. Sadly, society has positioned women as better housekeepers than managers of businesses, and as a result, they do not compare with in terms of growing their business like their male counterparts (Martinez & Nguyen, 2014).

However, the integration of ICT in women's enterprises may help their improvement. There is a considerable gap in the literature regarding the importance of ICT in women-owned businesses. Most studies, for instance, Martin and Wright (2005); Cisco (2015), and Marzocchi and Bonewit (2015) have focused on Western nations. The few that have been conducted in developing countries such as Rwanda suggest a sustainable need to uncover the necessity for ICT in women-owned businesses in Rwanda and

other developing nations (Suresh, 2011; Mundere, 2015). Recent literature indicates that the Internet contributes actively in finding solutions to challenges faced by businesses, particularly, a women-owned business in developing countries (National Women's Business Council, 2015).

This study was divided into six chapters. The first chapter introduces the study, the background of the problem, and the problem statement. It addresses the objectives, formulates research questions while delineating the scope and the rationale of the research. Chapter Two explores the literature review on the importance of ICT in women-owned businesses in Kigali, while Chapter Three discusses the adoption of ICT theories and models. Chapter Four addresses the research design and methods that guide the study. Chapter Five presents and discusses the findings. It also presents the designed integrated model. Chapter Six concludes and addresses the recommendations of the study. The next section addresses the background of the problem.

1.2 Background of the problem

Small and Medium Enterprises (SMEs) actively contribute to income and job creation in developed and developing countries. Because of their financial power to funding government programmes, SMEs influence policymakers to adopt flexible business policies (Organisation for Economic Co-operation and Development, 2000; Edinburgh Group, 2014). However, in many economies, developed and developing, women are underestimated in business, and Rwanda is no exception (Martinez & Nguyen, 2014).

Rwandan beliefs and cultures perceive women to be responsible for housekeeping activities and discriminate them from running a business. Over the years, Rwandan women were excluded from succeeding and participating in legal activities, and they were not allowed to have their own properties (Fellman, 2012). Schooling started at the beginning of the 20th century and initially, girls were not allowed to attend primary school, and only boys were allowed to go to school. Girls received short training concerning reading, writing, housekeeping, and weaving (Freedman et al., 2006).

Girls attended primary school nine years after boys first attended and 26 years after boys for secondary schooling. However, their education was limited to teaching, social

work, and nursing. After independence in 1962, the following year in 1963, the national university of Rwanda was opened with only male students (Freedman et al., 2006; Fellman, 2012). Due to the patriarchal nature of the Rwandan society, coupled with cultural and religious beliefs, women's chances of accessing resources are very limited. Women cannot easily obtain a loan to open businesses because of lack of collateral. Some women revolt and claim their right to contribute actively to society as their male counterparts. There have been women who have started enterprises, and despite challenges, their businesses progress. A recent study identified many challenges faced by women-owned business in Kigali. These include lack of collateral to obtain a loan, high taxes, lack of information technology skills (e.g. Internet) and high-interest rates (Nsengimana et al. 2017).

Rwandan businesswomen still suffer from a lack of ICT skills; they rely on cellphone communication (Nsengimana et al., 2017). This situation can be related to the fact that over the years, girls have been discouraged from taking science courses such as mathematics and physics which are the foundational subjects for ICT (Freedman at al.; 2006).

ICT changes the way of doing things, how people interact, and it plays a massive role in the business world. Rwandan women entrepreneurs should learn how to use and integrate ICT into their daily business activities to be more productive and efficient. This is in line with the United Nations (UN) goals to improve women's socio-economic status and ICT skills while eradicating poverty by 2030 (UN, 2016).

Despite the lower education level of many women-owned business and the challenges they face to use smart ICT, the UN suggests that governments and the private sectors should ensure that women develop in the areas of socio-political-economic development. One way to realise this is to build women's capacity in ICT skills and encourage them to integrate ICT into their business operations to enhance efficiency and productivity (UNCTAD, 2014).

The researcher has investigated various scholarship sources such as Google scholar site; perused 'X'; Cape Peninsula University of Technology (CPUT) repository. However, the lack of effort on ICT and business in Rwanda is evident (Aggarwal et al., 2012; Mumporeze & Prieler, 2017). Therefore, there was a need to conduct an in-depth

study on utilisation and uptake of ICT as tools for promoting efficient business practices among women-owned enterprises in Kigali, Rwanda. Thus, the study looked at how women-owned businesses in Kigali can use ICT to transit from traditional business to digital to develop their enterprises. This section summarised the background of the problem. The following section addresses the problem statement of the study.

1.3 Problem statement

Small and medium businesses create more jobs and resulting in revenue mobilisation and rapid socio-economic development in many developed and developing economies (Yusuf, 2013). Globally, women-owned businesses account for approximately 25%; these are small businesses with lower income, particularly in developing economies (International Labour Office (ILO), 2015).

In many developing economies, cultural beliefs and gender inequality ascribe women to be responsible for housekeeping activities and discriminate against their running of the business and Rwanda is no exception (Martinez & Nguyen, 2014; Brooks, 2018; Pro-Femmes/Twese Hamwe, 2019). Despite women-owned SMEs representing around 33% of all registered businesses in Rwanda, they make up the majority (51%) of the Rwandan population (Rwanda. NISR, 2018). They face challenges in running a business in Kigali such as gender inequality, access to finance, sexual harassment, inability to travel, and gender digital divide, where 8% females' householder have access to Internet opposed to 9.6% of males. 50.9% of females possess a cellphone versus 68% of males' households. Besides these, they lack the entrepreneurship and ICT skills which are pillars of business performance and successes (Kelley et al., 2015; National Institute of Statistics of Rwanda, 2016:120, 123 & Nsengimana et al., 2017).

ICT can be a powerful tool to mitigate and find a solution or part solution of several challenges faced by women-owned businesses in Kigali. Some of them mentioned in the previous paragraph if are integrated effectively into daily business operations. As a result, their businesses can improve performance and competitiveness, leading to growth and sustainability (UNCTAD, 2014). However, they are factors that can hamper the integration of ICT in women's SMEs such as the attributes of entrepreneurs that influence their position to embrace or oppose the integration of ICT in SMEs; inappropriateness of ICT for the form of women enterprises as most of their businesses

are micro-enterprise and many ICT software look too enormous to be used by micro-enterprises; the cost of ICT device may challenge the entrepreneur, and insufficient network coverage (Vickery et al., 2004; Jaganathan et al., 2018).

Although the factors hamper the integration of ICT into women enterprises, a recent study by Kamberidou (2020) revealed that adoption of ICT among women entrepreneurs in both developed and developing countries would be a sustainable solution to overcome the challenges they face such as inadequate access to finance and information, market, skills, competition, business management, and gender inequality in entrepreneurship.

A study conducted in 10 developing countries revealed that less than 50% of females were online compared to males, and 30-50% were using the Internet (World Wide Web Foundation, 2016). In Rwanda, only 50.9% of females' households had access to cellphone compared to 68% males' households, and 8% of females' households accessed the Internet versus 10% males' householders (NISR, 2016).

Not much research has been done on ICT and business in Rwanda (Aggarwal et al., 2012; Mumporeze & Prieler, 2017) and to date, research has not looked specifically at the importance of ICT in women-owned SMEs in Kigali, Rwanda. Thus, it was necessary to carry out an in-depth study on utilisation and uptake of ICT as tools for promoting efficient SMEs practices among women-owned enterprises in Kigali, Rwanda. This study promotes gender equality in entrepreneurship, and it attends to close the entrepreneurship gender gap; promoting integration and usage of ICT among women enterprises, while closing the gender digital divide. This is in line with the Rwandan Government's 2020 Vision aimed to integrate women in mainstream economic and technology initiatives.

This study is in line with Rwanda's Sustainability Development goals in implementation as detailed in the 2019 Voluntary National Review report designed to achieve gender parity in all spheres of life in the country including political, economic, social, education for all, while eradicating poverty by 2030 (Rwanda. Ministry of Finance and Economic Planning, 2019). The UN 2030 Agenda for Sustainable Development Goals (SGDs) is aimed at achieving gender equality and eradicating poverty worldwide by 2030 (UN, 2016), and African Agenda 2063 is a strategic framework designed by Africa Union

(AU) aimed at integrating women and men equally into the mainstream life of African countries. The following section addresses the research aim.

1.4 Research aim

The aim of the study was to identify the importance of ICT in women-owned businesses in Kigali. To enable meeting the research aim, the researcher evaluated the opinions, attitudes, feelings and perceptions of women-owned businesses in Kigali, Rwanda with regards to the importance of ICT in women-owned businesses. This was based on the United Nations Conference on Trade and Development (UNCTAD) Empowering Women Entrepreneurs through ICT held in 2014.

This research explored how ICT, particularly Internet and cellphones, could be integrated and used in women enterprises in Kigali, Rwanda in order to improve productivity and competitiveness. This research targeted women-owned SMEs in the city of Kigali, the administrative and economic capital of Rwanda. Furthermore, this research could also provide knowledge to women in micro-enterprises as they can use ICT to move forward to SMEs. Therefore, this research may be valuable to women entrepreneurs, Rwanda Chamber of Women Entrepreneurs (RCWE), and Private Sector Federation (PSF). Based on the results which identify the importance of ICT in women-owned businesses in Kigali, Rwanda, the researcher proposed an integrated model that could be used to boost women enterprises in Kigali and other developing economies.

The contribution of this research could improve women-owned businesses competitiveness, effectiveness, efficiency, and growth in Rwanda and developing countries. It is also in line with the government's plan to promote ICT in all country services and UN development plan to promote women to eradicate poverty and achieve sustainable economic growth (UN, 2016; Rwanda. Ministry of Finance and Economic Planning, 2019). Integration of ICT in women-owned business is a positive move to close the digital gender divide. Moreover, it was essential to conduct this study in order to identify the importance of integration and use of ICT in women enterprises since business is under the pressure of the fourth industrial revolution, which is transforming the ways of doing business, creating both opportunities and threats through Artificial Interagency (AI). It is vital to arm women entrepreneurs with ICT to

face the fourth industrial revolution challenges. To achieve the aim of the study, research objectives were formulated. The next section addresses these objectives.

1.4.1 Research objectives

This research comprised the following research objectives:

1. To identify the socio-economic factors influencing women in Kigali, Rwanda to join entrepreneurship.

2. To identify the constraints experienced by women entrepreneurs in doing small and medium business in Kigali, Rwanda.

3. To explore how information and communication technology could intervene to find the solution to constraints facing women entrepreneurs in doing small and medium business in Kigali, Rwanda.

4. To investigate whether Rwanda's administration and stakeholders' information and communication technology policies, support the successful integration and use of information and communication technology in women enterprises in Kigali, Rwanda.

5. To develop a model that could be used to improve the efficiency, effectiveness, and competitiveness of women enterprises.

1.5 Research question

The research questions were divided into two groups respectively, the main research question and sub-research questions.

1.5.1 Main research question

The following primary research question directed the study:

What is the impact of integration and use of information and communication technology in women small and medium enterprises (SMEs) in Kigali, Rwanda?

The intention was to propose an integrated model that will help women entrepreneurs owning small and medium enterprises (SMEs) in Kigali, Rwanda to use ICT in their businesses, to find solutions to the challenges they face in doing business in order to improve their efficiency, effectiveness, competitiveness, and sustainable growth in the fourth industrial revolution. Therefore, the following sub-research questions were formulated to guide this research.

1.5.2 Sub-research questions

1. What are the socio-economic factors influencing women in Kigali, Rwanda to join entrepreneurship?

2. What are the constraints experienced by women entrepreneurs in running small and medium businesses in Kigali, Rwanda?

3. How could information and communication technology intervene to find solutions to constraints facing women entrepreneurs in doing business in Kigali, Rwanda?

4. Does Rwanda's administration and stakeholders' information and communication technology policies support the successful integration and use of information and communication technology in women small and medium enterprises in Kigali, Rwanda?

The following section introduces the research design and methodology of the study.

1.6 Research design and methods

The research design is the plan of a study. According to Mouton (2001), the research design starts when a researcher composes research questions and sets objectives to attain. Plooy (2009) argues that the measure of opinions, attitudes, and feelings of selected women-owned business in Kigali toward the importance of ICT in their business, involves digital data collection that is analysed statistically. The results can be generalised to all women-owned business in Kigali and despite the nature of this study, in line with Mouton (2001), the quantitative methodology has been. In return, the quantitative method collects cross-section data through a survey questionnaire and analyses data statistically using the Statistical Package for the Social Sciences latest version (SPSS 26) and Stata 16 version. The details of the research design and methodology have been provided in Chapter Four. The following section revealed the paradigm that underpins the study.

1.6.1 Research philosophy

Research philosophy concerns exploring how knowledge of ICT can be acquired and used by women to improve their businesses in Kigali, Rwanda (Creswell, 2003). Positivism philosophy underpined this study. The researcher believes that the truth exists among women-owned SMEs in Kigali. That truth must be searched and found scientifically. The only way to find this truth was to survey women-owned SMEs in Kigali (Creswell, 2003; Greener, 2008). From the results, the truth on the importance of ICT in women-owned businesses in Kigali, Rwanda will be obtained. Chapter Four further described the research philosophy. The next section introduces the method to carry out the research design.

1.6.2 Quantitative method

The purpose of this research was to evaluate the opinions, attitudes, feelings and perceptions of women-owned businesses in Kigali, Rwanda with regards to the importance of ICT in women-owned businesses. These variables will be presented

measurably. The quantitative approach is appropriate when a researcher needs to quantify the level of the variables (Kumar, 2011). The quantitative variable defines the gravity of the query and influences a decision-makers solution. Measures that deliver approximate figures can be trusted to establish a correlation between concepts (Bryman, 2012). In order to achieve measurement, the researcher designed a structured survey questionnaire based on the literature review, input from credible researchers and international organisations to gather data from women-owned business in Kigali. The reasons for selecting quantitative methodology was explored further in Chapter Four. The next section provides an overview of data collection, the target population, sampling method, the pilot test and data analysis.

1.6.2.1 Data collection

Data gathering in this research used the techniques enumerated below. The details of each technique will be discussed in detail in Chapter Four. The techniques used were: Personal survey; Computer-Assisted Personal Interviewing; Close-ended questionnaires.

1.6.2.2 The target population

The population in this study is woman who runs SMEs in Kigali. However, the researcher collected data from a sample population of 377 women-owned SMEs in Kigali. A sample population is a portion of the population from whom the researcher gathers data. Sample population represents the entire population; the results generalise to the whole population (Greener, 2008; Jensen & Laurie, 2016). Chapter Four will provide details of the population.

1.6.2.3 Sampling method

Sampling methods refer to the technique the researcher applies to select the sample population (Barreiro & Albandoz, 2001; Kumar, 2011). This study used the purposive technique. The researcher selected the sample population according to his will, judgment, purpose, and projection. It is most reliable to reach women owned-businesses in Kigali and will deliver high quality of information, with little error or free

from error and bias (Marchall, 1996; Denscombe, 2007). Further details will be discussed in Chapter Four. The following section introduces the pilot test.

1.6.2.4 Pilot test

Before starting the real data collection, the researcher conducted a pilot test to ensure the validity and reliability of the questionnaire. The pilot test helped the researcher ensure that the sample population understands the questionnaire. It allowed the researcher to alleviate bias and formulate a relevant questionnaire (Mouton, 2001; Greener, 2008). The design of the questionnaire will be discussed further in Chapter Four.

1.6.2.5 Data analysis

Descriptive statistical analysis, correlation analysis, inferential statistical analysis, logistic regression, and reliability tests were used to find the level and relationship of variables. The SPSS, version 26 and Stata, version 16 will be used to analyse data. The details will be described in Chapter Four. The next section emphasises the validity of the study.

1.7 Validity

Validity refers to any consultation, correction or adjustment done on the research design and its components in order to improve quality. The validity is achieved when the instrument achieves what is set out to measure; it must cover all aspects of the phenomenon under investigation (Kumar, 2011). The validity of the questionnaire was defined on how women-owned businesses in Kigali responded. Since their participation rate will be higher, coupled with the excellent quality of response, the questionnaire will be valid (Jensen & Laurie, 2016). The validity will be debated in Chapter Four. The following section introduces the reliability of the study.

1.8 Reliability

Reliability involves testing, experimenting, and measuring results multiple times and obtaining the same findings. A research instrument is reliable when a researcher

measures a construct and it is consistent across time, across different researcher and across items (Maree, 2007; Plooy, 2009; Kumar, 2011). To achieve reliability, the researcher should consult experts to design a relevant research instrument. Cronbach's Alpha coefficient will be used to measure the score of reliability. Cronbach's Alpha coefficient of 0.7 and above will be suitable. Further details will be highlighted in Chapter Four. The next section introduces the ethical consideration.

1.9 Ethical consideration

Maree (2007) pointed out that technically, ethics is about understanding what is right or wrong; what the researcher will do or stop in the study process. The Code of Ethics is a moral norm that governs a society or institution based on the importance, values and culture of a group or organisation. Data collection from women-owned small and medium-sized businesses in Kigali and report writing were conducted in line with the CPUT research ethics policy (Maree, 2007; CPUT, 2013).

In order to ensure ethical consideration during the field data gathering, the researcher composed a relevant survey questionnaire which received approval from the University Faculty of Business and Management Sciences Ethics Faculty Research Committee (FREC) for approval FREC No 2019FOBREC687 (See Appendix F). Authorisation Ref: RCWE//2018/ch.040 was also received from Rwanda Chamber of Women Entrepreneurs (RCWE/PSF) to collect data from women-owned SMEs in Kigali, Rwanda (See Appendix C).

During data gathering, the data was collected with the consent of respondents, maintaining their privacy, anonymity and avoiding any harm. Respondents were informed that they could abstain from answering a question and that data collection was only for academic purposes.

During thesis writing, the researcher respected copyright of authors, referencing any research material used. The findings were based on collected data, free of manipulation and only the researcher had access to data. The details of ethical consideration will be provided in Chapter Four. The next section presents the limitations of the study.

1.10 Limitation of the study

This study used a quantitative methodology to collect and analyse data. The mixed and qualitative methods were excluded from this study. It would have been useful to conduct research on a few provinces or the country, however, due to the limited budget, time, and transport challenges, the research focussed only on the City of Kigali. The sample population was limited to formal, women-owned SMEs in Kigali who were 18 years and over that operate in the importation, exportation, wholesale, retail, ICT, manufacturing, transport, agriculture, construction, and service industries. Businesses that were excluded included large and informal businesses, women businesses in the informal sector, women-owned business less than 18 years old, and businesses located out of Kigali city.

The finance restriction could not allow the researcher to travel from Cape Town in South Africa to Kigali, Rwanda, pay accommodation and travelling fare during the data collection. For this reason, researcher assistant was appointed to collect data.

The researcher does not have control over the respondents' responses; they may not provide accurate responses to some questions that could affect the validity and reliability of results. The next section emphasises the significance of the study.

1.11 Significance of the research

Businesswomen in Kigali face many challenges, such as access to ICT (Nsengimana et al., 2017). This study was significant because it showed how the adoption of ICT in women businesses can help find solutions to challenges faced in running small businesses in Kigali. Leverage from ICT improves women competitiveness on the market dominated by men. Apart from enhancing women knowledge and skills regarding business, ICT also improves women skills in social and public health as they can consult the Internet on the prevention of diseases and improve their children and families' welfare.

This research designed a model that can be applied to improve women-owned business competitiveness, effectiveness and efficiency in Rwanda and developing countries. It is also in line with the Rwandan government’s plan to promote ICT in all

services in the country which is in line with South Africa National Research Strategies and UN development, which aims to promote women to eradicate poverty and achieve sustainable economies (Rwanda. Ministry of Finance and Economic Planning, 2 000; South Africa, 2002; UN, 2016). Integration of ICT in women businesses is a positive move to close the ICT gender gap, help women-owned businesses to identify new target markets and niche markets to expand their businesses.

The researcher is a male who was an entrepreneur for more than two decades in Kigali. Women were his main suppliers and despite the constraints they faced, they conducted their businesses efficiently. The researcher maintains that women-owned businesses in Kigali need to be supported by the community they serve. During the time that the researcher worked as an entrepreneur in Rwanda, he experienced and understood the challenges faced by women-owned businesses, particularly the patriarchal attitudes and stereotypes by men-owned businesses. The researcher infers that entrepreneurship and ICT adoption can change the status quo towards gender entrepreneurship parity and close the digital gender divide in Kigali.

This study is aimed at women entrepreneurs and enhancing their lives. It calls on the RCWE, PSF, government and stakeholders to invest more in the integration of ICT in women businesses, particularly Small and Medium Enterprises (SMEs) that will be able to run modern businesses. This will assist them accelerate their business growth, improve their creativity and innovation, create new jobs, boost socio-economic development and most importantly deal with the challenges of the fourth industrial revolution.

This research will contribute to the body of knowledge, and other researchers interested in ICT and women enterprises can use as a reference. The study fills the gap on the body of Knowledge by indicating how the Internet and cellphone adoption among women-owned small and medium-sized enterprises could overcome the constraints they face in developing countries and ultimately position their businesses. This study's unique contribution to the body of knowledge is developing a model that indicates the combination of various factors can be applied to enhance women enterprises performance. The following section explains the expected outcome of this research.

1.12 Expected outcome

This research will identify the factors influencing women to start their own businesses. It identifies the constraints facing women entrepreneurs in running a small and medium business in Kigali, Rwanda. It indicates how ICT could intervene to mitigate or find the solution to constraints facing women entrepreneurs in running small and medium business in Kigali, Rwanda, and evaluate how stakeholders' ICT policies support the successful integration and use of ICT in women-owned enterprises.

Finally, an integrated model will be developed to justify the importance of ICT in women-owned business performance. It could improve women enterprises' efficiency, effectiveness, competitiveness, and performance in Kigali, Rwanda, and other developing economies.

1.13 Outline of the research

An outline of this study is presented in Figure 1.1.

1.13.1 Chapter One: Introduction and background

This chapter offered a brief overview of the research. It contained elements such as the problem statement, research objectives, research questions, the significance of the study and limitations.

1.13.2 Chapter Two: A literature review

The literature review has been known as the backbone of a quantitative study. It is essential to understand the current scholarship on the importance of ICT in women-owned SMEs in Kigali. To do so, the flow of literature review follows the research question chronologically. It will address women's' motivation to start SMEs in Kigali, identify the constraints they face, indicate how ICT could mitigate or find the solution to those constraints, and the role of government and stakeholders to support the adoption of ICT in women-owned SMEs in Kigali. The hypothesis was generated from the literature review and cited. The following chapter focuses on ICT adoption theories and models.

1.13.3 Chapter Three: Theories and models underpinning ICT adoption

It is essential to understand theories and models underpinning the adoption of ICT. Since women-owned SMEs in Kigali face constraints in running SMEs, it has been suggested that ICT could be a solution or part-solution to those constraints. Therefore, this chapter addresses the Technology Acceptance Model (TAM), Technology-Organisation-Environment Theory (TOE), Diffusion of Innovations Theory (DOI), Actor-Network Theory (ANT), and the Unified Theory of Acceptance and Use of Technology (UTAUT). Despite the business environment in which women-owned SMEs in Kigali work, the technology-organisation-environment theory of Tornatzky and Fleisher (1990) will be used to indicate how ICT could improve the performance, growth and sustainability of women-owned businesses. The next section introduces the research design and methodology.

1.13.4 Chapter Four: Research design and methodology

Chapter Four is concerned with the research design and methodology used for this study. These methods seek to answer the research question and meet the objective of the study. The items to conduct this research, including philosophy, methodology, methods and techniques for data collection, analysis, validity, reliability and ethical consideration. These will be explore in detail in Chapter Four. The next section emphasises the data presentation and discussion of research findings.

1.13.5 Chapter Five: Data presentation and discussion of findings

Chapter Five analyses the data and presents and discusses the findings to answer the research questions. The different analysiy types include descriptive statistics, logistic regression, inferential analysis, reliability tests, test for normality, and structural equation modelling. The integrated model is developed and discussed in this chapter. Also, the findings are presented in tables and charts. The Literature review used to discuss and compare the current results with the existing ones that help situate this study in the body of knowledge and identify the possible gap. The last chapter provides conclusions and proposes recommendations.

1.13.6 Chapter Six: Conclusions and recommendations

Chapter Six draws a summary of preceding chapters and addresses the recommendations that women entrepreneurs and policymakers could use to promote women enterprises and ICT Adoption. Conclusions to the study are provided. It addition, future research in the field of ICT and women-owned businesses is proposed.

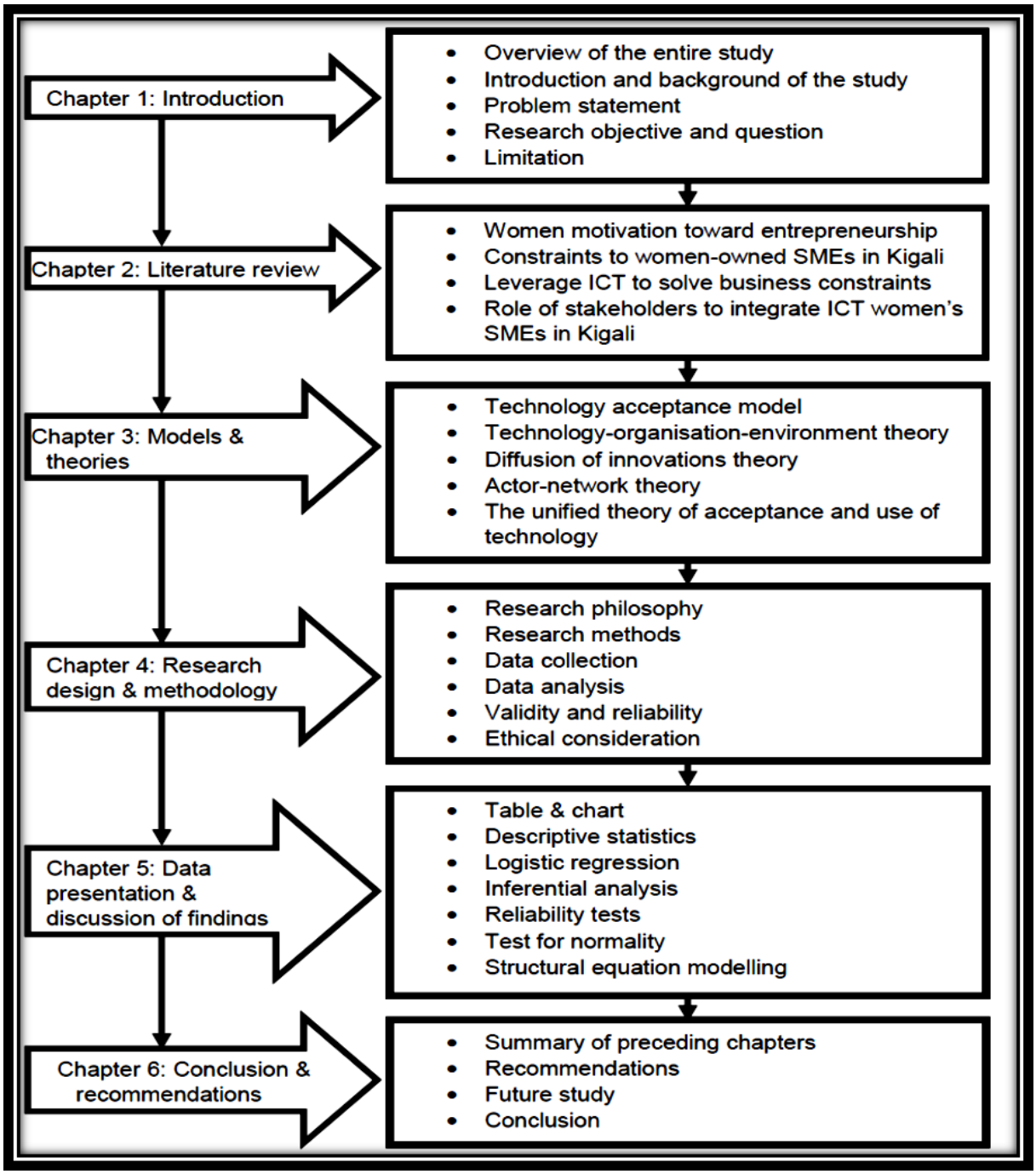

Figure1.1: Research outline

1.14 Summary of this chapter

Small and Medium Enterprises (SMEs) are at the centre of job creation and social-economic growth. Due to patriarchy, culture and beliefs, women are marginalised in the running of businesses in Rwanda and are expected to perform household activities. As a result, women enterprises are small in size compared to those of men; they face many challenges such as access to finance and high interest rates, among others. However, ICT can be a powerful tool to mitigate or offer solutions to several problems faced by women owned-businesses if they are integrate effectively into their daily business operations.

This study aims to identify the importance of integration and use of ICT in women-owned SMEs in Kigali, Rwanda. The study underpins positivism philosophy; it adopts a quantitative approach to collect and analyse data. A sample of 377 women entrepreneurs in SMEs in Kigali, Rwanda participated in the survey questionnaire. SPSS and Stata were used to analyse the data.

Data collection was in line with CPUT research ethics policy such as informed consent; privacy; anonymity; confidentiality and avoiding harm. This study is fundamental as it promotes women enterprises by proposing the adoption of ICT into their businesses and it seeks to develop an integrated model that can be applied to strengthen women-owned businesses in Rwanda. The next chapter addresses the literature review.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

The previous chapter introduced the research, described the background of the problem, design the research questions, hypothesis, and set objectives of the study. It adopted a quantitative method to carry out the study. This chapter focusses on the literature review. A literature review is about what is known on the topic under investigation and a researcher reviews literature to gain knowledge on the importance of integration of information and communication technologies (ICT) in women-owned businesses in Kigali, Rwanda (Mouton, 2001; Bryman, 2012). The concept of a literature review and scholarship review have the same meaning. Therefore, as scholarship review being the recent term, literature review and scholarship review are used synonymously (Mouton, 2001).

This literature review contains five parts, as indicated in Figure 2.1 and detailed in Table 2.1. These parts are entrepreneurship; women enterprises; motivation to start a business; potential constraints experienced by women entrepreneurs in running small and medium businesses in Kigali, Rwanda; ICT intervention to find solutions to constraints facing women entrepreneurs in doing business in Kigali, Rwanda, and whether the Rwanda administration and stakeholders ICT policies support the successful integration and use of ICT in women enterprises in Kigali, Rwanda. Table 2.1 summarises the flow of the literature review.

- Firstly, the review focuses on the introduction of entrepreneurship and women entrepreneurs.
- Secondly, it identifies the potential socio-economic factors influencing women in Kigali, Rwanda to join entrepreneurship. Literature review is the backbone of a quantitative research design, it provides information of previous studies about the first research question "What are the socio-economic factors influencing women in Kigali, Rwanda to join entrepreneurship"? It is also highlights the importance of that research question and then shows the links towards the

hypothesis one "There is a positive relationship between motivation and new women enterprises creation in Kigali, Rwanda."

- Thirdly, the literature review builds on the second research question to identify the probable constraints experienced by women entrepreneurs in doing business in Kigali. It helps a researcher to gain insight on the second research question "What are the constraints experienced by women entrepreneurs in running small and medium businesses in Kigali, Rwanda." It also assisted the researcher in formulating the hypothesis: "There is a negative relationship between the constraints faced by women-owned businesses in Kigali, Rwanda and the management of small-sized enterprises."
- Fourthly, it explores how ICT could intervene to find solutions to constraints facing women entrepreneurs in doing small and medium business in Kigali, Rwanda. Based on existing research, the literature review provides information on the third research question "How could information and communication technology intervene to find solutions to constraints facing women entrepreneurs in doing business in Kigali, Rwanda? Moreover, it aids the researcher to state a hypothesis, "There is a negative relationship between constraints faced by women-owned business in Kigali, Rwanda and the use of Internet into women businesses in Kigali, Rwanda to find a solution to those constraints."
- Fifthly, the literature review focuses on the fourth research question which investigates whether the Rwandan administration and stakeholders' ICT policies support the successful integration and use of ICT in women enterprises in Kigali, Rwanda. It also assisted the researcher in formulating the hypothesis, "There is a positive relationship between stakeholders' ICT initiatives and effective integration and use of ICT in women enterprises in Kigali, Rwanda in order to ensure competitiveness."

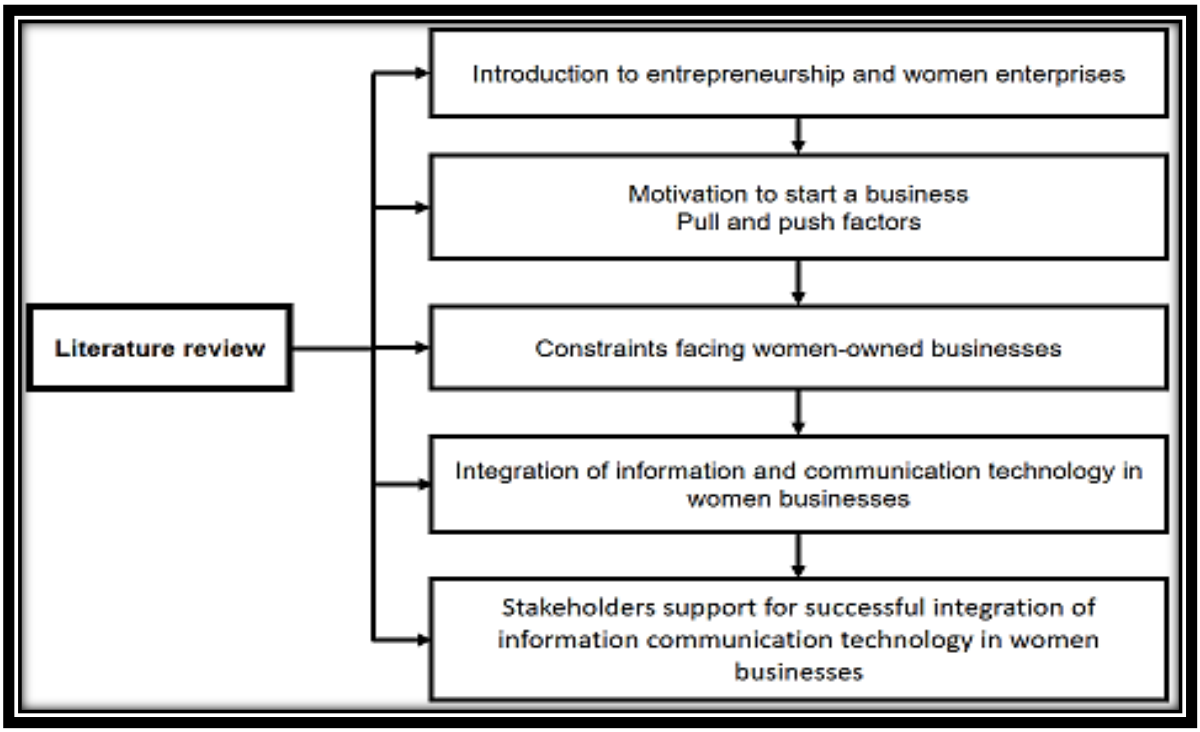

Figure 2.1: Literature review framework (Research, 2020)

Table 2.1: Theoretical framework of literature review

Parts	Contents
Introduction	Literature review and entrepreneurship concepts
	Importance of literature review
	Methods of organising a literature review
	Entrepreneurship and entrepreneur
	Woman entrepreneurs and the impact of their businesses in Rwanda
	Sustainability of women small and medium businesses
	Evaluation of the business performance through the business lifecycle
Research question 1 Hypothesis 1	What are the socio-economic factors influencing women in Kigali, Rwanda to join entrepreneurship? There is a positive relationship between motivation and new women enterprises creation in Kigali, Rwanda.
	Motivation to start a business
	Push and pull motivation factors to start a new venture
	Necessity versus opportunity entrepreneur
Research question 2 Hypothesis 2	What are the constraints experienced by women entrepreneurs in running small and medium businesses in Kigali, Rwanda? There is a negative relationship between the constraints faced by women-owned businesses in Kigali, Rwanda and the management of small-sized enterprises.
	Gender inequality; cultural; fear of failure; inadequate access to finance, lack of collateral; high-interest rate; high taxes rate; high cost of telecommunication; high transport cost; access to government services; corruption from government officials; sexual harassment; the Human Immunodeficiency Virus (HIV) and Acquired

	immunodeficiency syndrome (AIDS); physical mobility; lack of entrepreneurship skills, training, and education; lack of information and communication technology skills; business competition; lack of market; inadequate access to networks.
Research question 3 Hypothesis 3	How could information and communication technology intervene to find solutions to constraints facing women entrepreneurs in doing business in Kigali, Rwanda? There is a negative relationship between constraints faced by women-owned business in Kigali, Rwanda and the use of Internet into women businesses in Kigali, Rwanda to find a solution to those constraints.
	This research question three discussed the constraints in research question 2 and proposed an ICT solution.
	Problems of integration of ICT in business
	The downside of Information and Communication Technology
Research question 4 Hypothesis 4	Does Rwanda's administration and stakeholders' information and communication technology policies support the successful integration and use of information and communication technology in women small and medium enterprises in Kigali, Rwanda? There is a positive relationship between stakeholders' ICT initiatives and effective integration and use of ICT in women enterprises in Kigali, Rwanda in order to ensure competitiveness.
	Information and communication policy
	Telecommunication infrastructures
	Stakeholders' ICT training initiatives among women-owned SMEs in Kigali
	Women-owned SMEs in Kigali ICT support project integration
	The motivation of women entrepreneur role model in ICT
	Summary of chapter

Figure 2.2 provides a framework of the interrelationship between the literature review, research questions, hypothesis and objectives. This framework explains how the literature review addresses and answers the research questions, tests hypothesis and meets the research objectives. It also addresses the importance of the literature review, entrepreneurship and entrepreneur concepts, the importance of SMEs, and the sustainability of the business. The items mentioned above do not answer the research question, but it offers insight on entrepreneurship in general and in particular on women entrepreneurs in Rwanda.

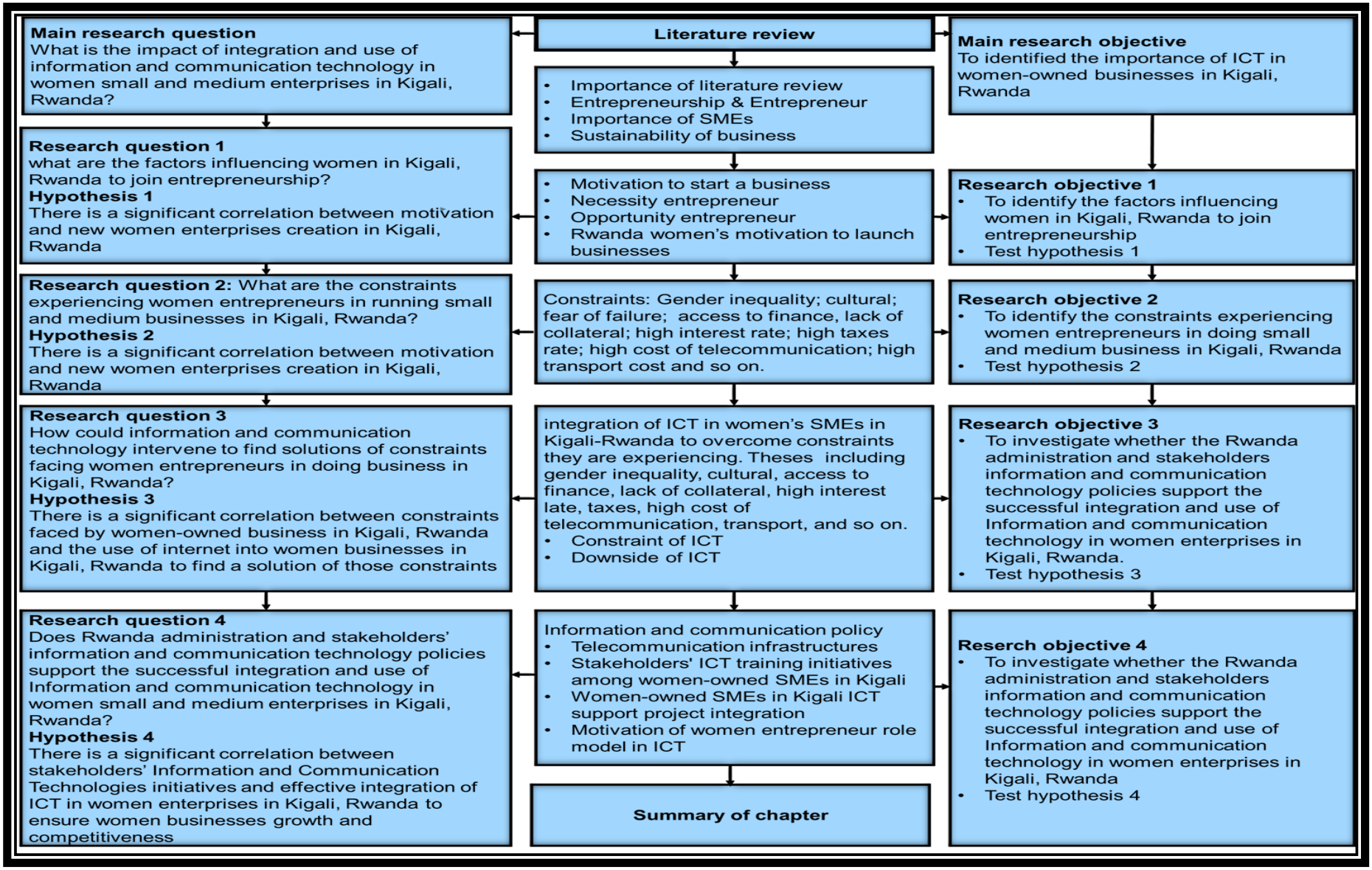

Figure 2.2: Framework of the interrelationship between literature review, research questions, hypothesis and objectives (Researcher, 2020)

2.2 Importance of the literature review

The literature review is the primary tool to obtain more in-depth information on the importance of ICT in women-owned businesses in Kigali, Rwanda. Previous studies serve as the foundation for new research (Jensen & Laurie, 2016). Mouton (2001) suggests that the literature review should be broad, not focusing only on the area of study. It is important for a researcher to have insight on what motivates women to enter entrepreneurship; the challenges they face, and how they use ICT in their businesses. From Mouton's perspective, the literature review in this study does not have limits; the researcher explores the existing body of knowledge to saturation.

Kumar (2011) proposes review the recent literature in research. Mouton (2001) agrees with Kumar however, suggests that old literature should not be ignored. Perhaps, it may serve as a bridge that could offer a better understanding of the importance of ICT in women-owned businesses in Kigali, Rwanda. Mouton (2001) concludes that a robust literature review in social and business sciences should contain recent and past literature with a focus on current scholarships. Therefore, the development of this literature review focuses on recent studies, as suggested by Mouton (2001).

Figure 2.3 indicates the sources of scholarship the researcher consulted to constitute this study. Literature review is situated inside the circle and surrounded with the sources. These sources included books, legislation, video and audiovisual, conference proceedings, abstract in databases, newspapers, magazines, reports, theses and dissertations, course notes and class handouts, journal articles, dictionaries, correspondence, encyclopaedias, government gazette, government publications, Internet, and interviews.

A literature review has the power to change or propose a research topic, research questions, hypothesis, objectives, and methodology. It refreshed the researcher’s ideas and showed the reality of the importance of ICT in women-owned businesses in Kigali, Rwanda. The literature review clarifies the problem statement and shows the methodologies and techniques used by other researchers on similar studies. This assisted the researcher in deciding on valid and reliable methods to use in the study. A literature review further assists a researcher to identify gaps in the current body of

knowledge. Kumar (2011) and Jensen & Laurie (2016) suggest that researchers should formulate research questions after reviewing the existing body of knowledge.

Jensen & Laurie (2016) conclude that a good scholarship review provides a broad literature review on the topic and answers research questions; supports or rejects hypothesis. The literature review plays a significant role to situate the new study in the body of knowledge by comparing the results with existing scholarship reviews and similarities or differences can be identified (Kumar, 2011). Supporting and opposing views are among the characteristics of research, however, a researcher should be careful when discussing the arguments in previous studies and provide a rational explanation (Jensen & Laurie, 2016). Therefore, the literature review can be presented in different ways. The next section addresses the design of a literature review.

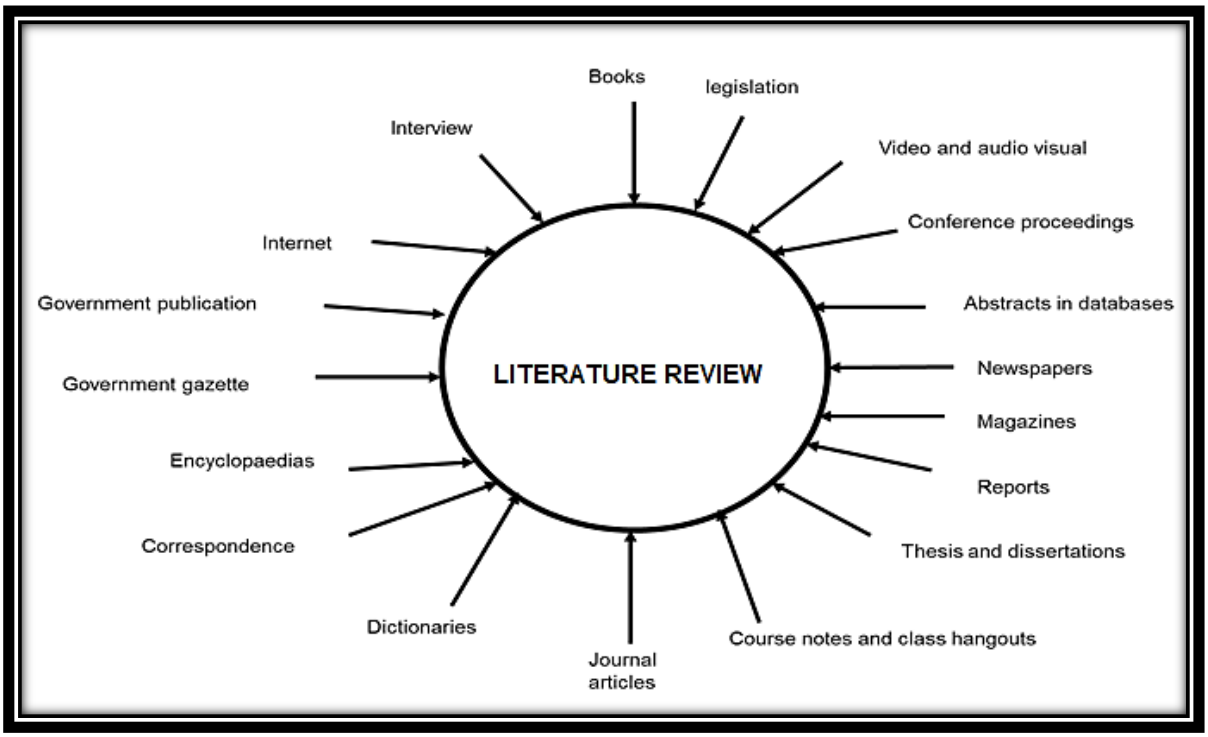

Figure 2.3: Sources of a literature review (Researcher, 2018)

2.3 Methods of organising a literature review

Mouton (2001) identifies six ways to classify a scholarship review. These are chronologically by date of study; school of thought; theory; definition; theme or construct; hypothesis; case study and method. The development of this scholarship review uses the theme and construct methods. It builds on key concepts of the study;

it explores the review of the problem statement, research questions and objectives, and defines the terms. The theme and construct technique is the most suitable for quantitative exploratory studies (Mouton, 2001; Kumar, 2011). This literature review provides the knowledge chronologically to research questions and seeks to meet the research objectives. It starts with the introduction of entrepreneurship with a focus on women-owned businesses in Kigali.

2.4 Entrepreneurship

Entrepreneurship play a significant role in the socio-political-economic development of a country. Without entrepreneurship, the country could suffer and it may be almost impossible to survive (Baron & Shane, 2005; Barringer & Ireland, 2008). Authors have failed to arrive at a conventional definition of entrepreneurship because of its complexity. Authors like Drucker (1985); McClelland (1987) and Chell (2008) tend to define entrepreneurship according to their field of specialisation, for instance, economic, psychology and management.

However, these authors concur that entrepreneurship stimulates socio-economic development, jobs creation and innovation. It plays a critical role in socio-economic growth in both developed and developing economies. Entrepreneurship is important in stabilising recession and inflation in a country. Furthermore, power of dominance is evident where countries with significant entrepreneurship dominate over others with weak entrepreneurship, for instance, the USA is regarded as the superpower in terms of entrepreneurship. Regarding gender and entrepreneurship, male entrepreneurs dominate women due to the cultural norms ascribed to men (Mahadea & Youngleson, 2013). Entrepreneurship is also known as an entrepreneur practice. The next section discusses the entrepreneur.

2.4.1 Entrepreneur

The concept of an entrepreneur has various definitions. However, it has the conventional definition unlike entrepreneurship which lacks a common definition. Timmons (1999:13) defines entrepreneur using a conventional definition:

"People who challenge convention in pursuit of new venture creation. Through innovation, they guide the way people live, work, learn, play, and lead".

However, there is no standard definition of a woman entrepreneur. There is a different perspective of who a woman entrepreneur is?

2.4.2 Woman entrepreneur/ woman-owned business

The concepts, woman entrepreneur and woman-owned business share the same definition, so they are used synonymously in this study (Carter & Jones-Evans, 2012; (Rashmi, 2016). There is no specific definition of a women-owned business. Authors define concepts depending on the country of origin. However, many economies, including Rwanda, do not have a specific definition of a woman entrepreneur (Vazquez, 2011).

However, the USA and India define woman entrepreneur based on ownership of her shares in a company. "Woman entrepreneur is a female or females who possess 51% or more of shares in the company. They assume daily business management" (Vazquez, 2011; American Express, 2014:11). However, contrary to the USA and India, the British considers complete ownership of shares and defines women-owned business as a woman who fully possesses 100% of business shares; she manages, controls and makes decisions regarding business (Carter & Jones-Evans, 2012).

Despite lack of a specific definition of a woman entrepreneur in Rwanda, the researcher being an entrepreneur in Rwanda for over twenty years, maintains that the British definition of a woman entrepreneur may be attributed to Rwandan women entrepreneurs. Due to the nature of women businesses in Rwanda, in general, they hold 100% ownership. This definition differs from the USA and India definition that woman ownership must be more than 51% of the total shares. Many women businesses in Rwanda are micro-enterprises and they have an impact in the country's economy as will be underlined below.

2.5 Impact of Small and Medium women enterprises in Rwanda

Women entrepreneurs in Rwanda penetrate all business industries despite the patriarchal and stereotypical society. They play a critical role in socio-economic development, they create jobs and contribute to 30% of GDP (Musomandera et al., 2015). According to NISR (2018), the country counts a total of 6 995 SMEs among them 2 030 (29%) belong to women. Table 2.2 summarises the statistical distribution of sole proprietor enterprises by sex of owner and size. These sizes are micro, small, medium, and large enterprises. Macro enterprises have one to three workers, including the owner. Macro enterprises account for a total of 167 055 enterprises, including 112 242 for men, and 54 813 for women. Small enterprises can have four to 30 workers, including the owner. There is a total of 6 829 small enterprises, men dominating with 4 824 enterprises, and women owning 2005 small enterprises. The medium enterprises have 31 to 100 workers, including the boss. There is a total of 166 medium enterprises, men representing 141, and 25 medium enterprises. The large businesses account for over 100 workers, including the owner. There are only 63 in which men are owners of 47 large business, and women 16. The total of all businesses in Rwanda is 174 113 (100%) with 117 254 (67%) men ownership and 56 859 (33%) women ownership.

The dominance of men in entrepreneurship in Rwanda is linked to the cultural and patriarchal society which assigns specific roles to men and women and ascribe women to run home-keeping activities while men are managing and controlling businesses. However, things changed after the genocide in the country in 1994. Women were around 70% of the population and they took the responsibility to raise children and contribute to the recovery of the economy. They became active in entrepreneurship and their numbers continue to grow, particular in Kigali (Uwantege & Mbabazi, 2015).

Table 2.2: Distribution of sole proprietor enterprises by sex of owner and size

Size	Sex of owner		
	Total	**Male**	**Female**
Micro (1-3)	167 055	112 242	54 813
Small (4-30)	6 829	4 824	2005
Medium (31-100)	166	141	25
Large (over 100)	63	47	16
Total	**174 113**	**117 254**	**56 859**

Source: Rwanda, National Institute of Statistics of Rwanda (2018)

As shown in Table 2.2, women businesses were concentrated to micro-enterprises. The next section discusses the sustainability of women businesses and an evaluation of their performance.

2.6 Sustainability of women-owned businesses

This research seeks to identify the importance of integration of ICT in women-owned businesses in Kigali to improve their businesses performance, growth and sustainability. A sustainable business is an established and stable business. An established business is an enterprise over three and a half years, performing well and growing (Nieuwenhuizen & Nieman, 2014). The question raised here is, how do we evaluate the performance of women-owned businesses in Kigali? The answer could be found in the business lifecycle model. Figure 2.4 summarises the business lifecycle. It can assist in indicating whether a business is progressing and proposes what can be enhanced or improved to keep businesses successful. It is a helpful model that covers all aspects of women businesses in Kigali. It strengthens their business plan and strategies. It is a model designed to guide and measure the performance of the business. It contains seven stages includes pre-startup which relates to the entrepreneur's motivation to start a business, accumulate resources and the process of starting a formal business.

The start-up stage refers to the commencement of the business which is when it is difficult to penetrate the market share. The successful launch of the business drives it to growth stage which defines the good performance of the business. This increases market share, profit, and income.

In the maturity stage, the business achieves sustainability and it is the higher level of business achievement. In this stage, the entrepreneur rewards himself/herself for the diligence and productivity. However, the decline stage occurs when a business could not be maintained on the maturity stage, it starts to go down.

The rebirth stage revitalises the business back to the maturity stage. Unfortunately, the death stage of business lifecycle brings about liquidation. Every stage has its goals and strategies.

There have been several studies in the literature reporting that the business lifecycle is the most used model in business, due to its capacity to cover all aspects of business life including advising entrepreneurs on what to do for each stage; setting goals, objectives, strategies and evaluating the challenges and performance of the business (Rwigema et al., 2008; Rudy, 2012; Nieuwenhuizen & Nieman, 2014; Erasmus et al., 2015). Furthermore, the business lifecycle correlates with this research, it matches with research questions and hypothesis as discussed in the sections below.

2.6.1 Pre-startup stage of the business lifecycle

As indicated above, the pre-startup stage of the business lifecycle corresponds with the first research question "What are the socio-economic factors influencing women in Kigali, Rwanda to join entrepreneurship?" and the first hypothesis "There is a positive relationship between motivation and new women enterprises creation in Kigali, Rwanda." In the pre-startup stage of a business, the business is not yet born, it does not contribute to the evaluation of business performance. However, it is the beginning of a venture that is going to begin. In this step, woman entrepreneurs are motivated to launch an enterprise, she has a business idea; she organises the resources (capital, human, and material) to launch an enterprise. She draws a competitive business plan and business model to position the business. She registers to run a formal business (Nieman & Nieuwenhuizen, 2009). In Rwanda, many businesses are registered with the Rwanda Revenue Authority (World Bank Group, 2019). The startup phase will be discussed in section 2.6.2.

2.6.2 Startup stage of the business lifecycle

Despite the motivation and putting together the resources to start a business, it is not easy to enter the market. The startup stage is also called infancy meaning the business is very young. An entrepreneur uses the resources and implements the business plan and model. It is a stressful stage because she must position the business and share the market with existing entrepreneurs. It requires courage, perseverance and motivation to push the business forward (Petch, 2016).

An entrepreneur starts to face challenges in the startup phase of a business. The literature indicates that the startup stage is the most stressful and difficult stage of the

business lifecycle. It is responsible for 25% of business closures within five years (Petch, 2016; Nieman & Nieuwenhuizen, 2009). This section is linked to the second research question "What are the constraints experienced by women entrepreneurs in running small and medium businesses in Kigali, Rwanda?" as well to the second hypothesis “There is a negative relationship between the constraints faced by women-owned businesses in Kigali, Rwanda and the management of small-sized enterprises.” Nieman and Nieuwenhuizen (2009) and Petch (2016) observed that the failure to position the business was associated with lack of consumers. This was a frequent constraint that many entrepreneurs face in the startup stage of the business lifecycle. Failure to do so could hinder the business from moving forward, resulting in it remaining small and necessitating a revision of its business model and products or services offered to satisfy consumers' expectations. Barakji (2016) proposed a guide to launch a successful venture including having a strong advisor team, a comprehensive business plan, serious market research, feedback from consumers and persistence. The successful startup phase of a business lifecycle leads to business growth. The growth phase stage of a business will be discussed in section 2.6.3.

2.6.3 Growth stage of the business lifecycle

Growth stage is also called a breakthrough. In this stage the business performs well, it increases income, profit and consumers and entrepreneurs employ talented people to sustain and move the business forward to maturity stage. However, during this stage, an entrepreneur is under pressure, for instance, to pay back the creditors. The competitors are watching her business to duplicate or open bigger ones that can shift consumers from her to the new ones. It is a stage of competition; the entrepreneur stands by her business, products, upgrading them and introducing innovative ideas (Nieman & Nieuwenhuizen, 2009; Petch, 2016).

The Rwanda. Ministry of Trade and Industry (2010) maintains that the SMEs growth suffers, particularly those of women due to the patriarchal society, inadequate access to capital, lack of entrepreneurship skills and competition.

The question arising is “How could information and communication technology intervene to find solutions to constraints facing women entrepreneurs in doing business in Kigali, Rwanda? and hypothesis “There is a negative relationship between

constraints faced by women-owned business in Kigali, Rwanda and the use of Internet into women businesses in Kigali, Rwanda to find a solution to those constraints." It is suggested that integration of ICT in women businesses can mitigate or resolve constraints facing women-owned businesses in Kigali, while improving their efficiency, effectiveness, performance and most importantly sustain the business (UNCTAD, 2014; Asia-Pacific Economic Cooperation (APEC), 2018).

Research conducted in 21 member states of APEC focusing on the integration of ICT in women's enterprises, concluded that cellphone and Internet search engine of things position their businesses. They obtained more services and reach networks easily via ICT. Successfully integrating and using ICT in their enterprises successfully contributed to their business growth. They became more effective, innovative, enhanced performance and a competitive edge (APEC, 2018). The next section explores the maturity stage of the business lifecycle.

2.6.4 Maturity stage of the business lifecycle

In the maturity phase, a business achieves its growth, objectives, and strategic goals. In this stage it is a sustainable business, where entrepreneurs enjoy the benefit of his/her hard work. Unfortunately, many women businesses in developing economies do not reach the maturity stage (Global Entrepreneurship Research Association (GERA), 2012; Petch, 2016). Few women-owned businesses in Kigali reach the maturity stage of the business lifespan (Rwanda. Ministry of Trade and Industry, 2010). Based on this, 96.4% of women businesses in Rwanda fall into micro-enterprises (Rwanda.NISR, 2018). Furthermore, many women-owned SMEs in Kigali face various constraints including access to finance, collateral, high tax rates which hampers the sustainability of the business (Mukamana, et al., 2017; Ndisanze, 2017). These constraints will be discussed later in the chapter as well how ICT could intervene to find solutions to constraints facing women entrepreneurs in doing business in Kigali, Rwanda? Nonetheless, failure to maintain a business to maturity stage falls in a decline phase that needs effort to revitalise.

2.6.5 Decline/rejuvenation stage of the business lifecycle

The phase of decline strongly challenges a business. This phase relates to a management failure to maintain business performance in the maturity stage. The decline means the negative performance of the business which drives the business down. Some businesses can stay on the maturity stage without going on the decline phase. Innovation is the secret to keep businesses on the maturity phase. The decline phase is associated with a drop in sales, income and profit. Businesses are challenged to meets its obligations. Consequently, some employees lose jobs and business lose talented employees as they resign to look for other employment (Nieman & Nieuwenhuizen, 2009). The decline stage requires effort to rebirth otherwise, the business is dead. Restoring the business is an important part of the lifecycle and the rebirth phase will be discussed below.

2.6.6 Rebirth and death stage of the business lifecycle

Management has to work hard to restore the business in the maturity stage. This demands a change of business model which comes with new strategies, short and long term objectives to rebirth the business. However, some businesses may or may not move back to maturity stage and this could lead to liquidation. However, successful integration of ICT in business and among employees could challenge the constraints facing an entrepreneur and stimulate the invention and innovation to reposition the business.

Indeed, seeking new markets and niche markets help a business to rejuvenate. For instance, Edgars, a retail chain in South Africa declined, but initiated changes, updated ICT, introduced a new business model and enhanced strategies and then returned to the maturity stage (Nieman & Nieuwenhuizen, 2009). Mandipaka (2014) observed that women's businesses in Kigali declined and were reborn. Many of them preferred the niche market to maximise sales and profit, due to lower or non-competitors. He added that cellphone applications helped them to reach their networks.

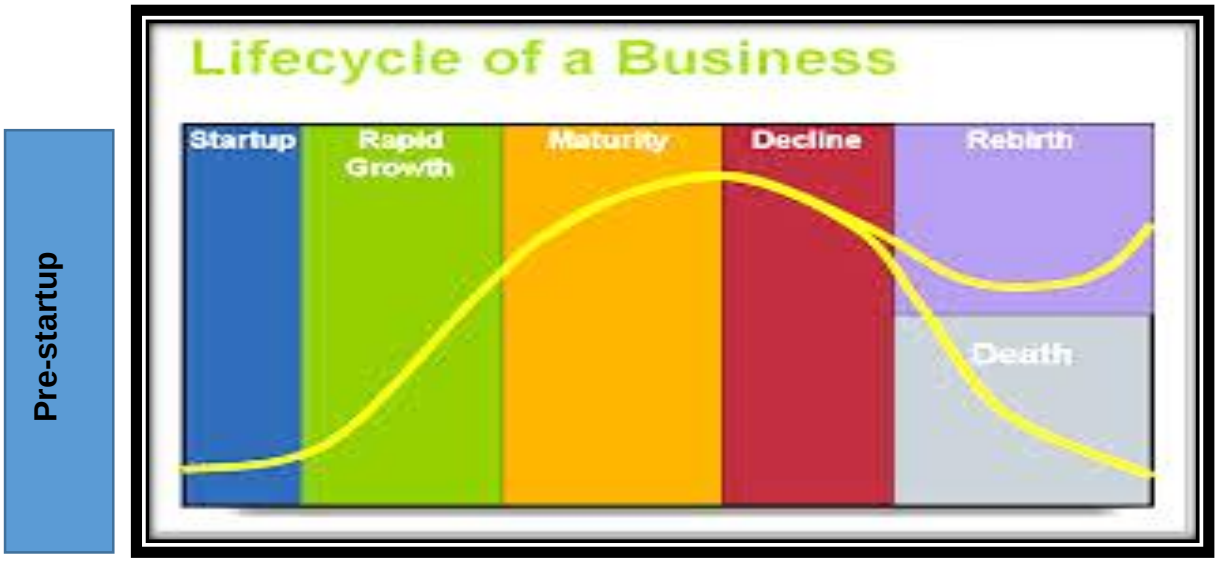

Figure 2.4: Lifecycle of a business (adapted from Rudy, 2012)

2.7 Womens' motivation to start a business in Kigali, Rwanda

Motivation is an intrinsic force pushing a person to do something, the achievement is the main objective. Achievement is the efficient accomplishment of a task that is difficult for other people to complete (Weibell, 2011; Cherry, 2018). Mahadea and Youngleson (2013) argued that motivation is the first and critical step in the entrepreneurship process, it involves an active decision making to start a new venture.

As discussed above, the business lifecycle model guides and evaluates the process of a business. In the pre-startup phase, the researcher emphasised that the entrepreneur has an entrepreneur intention, business ideas and is full of motivation to launch an enterprise. Furthermore, the motivation does not end to decide to start a business, it determines the factors that motivated an entrepreneur to launch a business and the category of businesses started.

Thus, the question raised is: "What are the socio-economic factors influencing women in Kigali, Rwanda to join entrepreneurship?" The objective of this first sub-research question was to identify the socio-economic factors influencing women in Kigali, Rwanda to join entrepreneurship. Therefore, it is important to identify the motivating factors inspiring women in Kigali to start businesses and the categories of businesses they launched and whether they were survival or opportunity businesses (Donna, et al., 2011). The next section considers the pull and push motivation factors influencing

women to join entrepreneurship and the role played in new women enterprise creation in Kigali, Rwanda.

2.7.1 Women Push and Pull motivation factors to start new enterprises in Kigali

Push and pull factors motivate women to start a business in Kigali. However, pushed and pulled entrepreneurs have different motives, missions, visions, and objectives to achieve (United States of America. United States Agency for International Development (USAID), 2009; Lionnesses of Africa, 2016; Hakuzimana, 2017). These factors are discussed below. Section 2.7.2 discusses the push factors that motivate women to start a business.

2.7.2 Push motivation factors

Push is defined as an exercise in power to someone or something or thought to move forward and achieve an expected result (Collins English Dictionary, 2018). Push factors in entrepreneurship is associated with a negative situation in which a person is facing. She decides to open and run a business not because she likes business but she does not have another source of income to survive.

This situation is beyond a person's control and pushes her towards entrepreneurship (necessity entrepreneur) as a solution to survive; she opens a business to generate income to meet her basic needs. But, she can close the business doors when she finds another source of income, for instance, employment (Dawson & Henley, 2012; Mahadea & Youngleson, 2013). Different authors identified push factors that motivated women entrepreneurs to launch new enterprises in Kigali (see Table 2.3). These include divorce or separation, finance, job dissatisfaction, maltreatment, unemployment, and women who are widowed (USAID, 2009; Hirwa, 2010; Vis, 2012; Lionnesses of Africa, 2016; Hakuzimana, 2017).

Table 2.3 summarises push factors that motivated women entrepreneurs to start businesses in Kigali. A woman can divorce or separate from their husband who was the provider for the family. This situation pushes a woman to entrepreneurship to generate income to survive. Regarding finance, some women earn little money which

may not meet the family's needs. They are pushed to entrepreneurship to generate more money that could satisfy their demands. Some women are not happy with their employment and they embark on entrepreneurship to have peace of mind. In the workplace, some women are abused or marginalised and resign and join entrepreneurship to make a living.

Furthermore, the number of unemployed increases every year as there are new graduates who cannot find jobs in the labour market and they join entrepreneurship to make money. The loss a husband or breadwinner could bring financial difficulties to a family and in some instances the widow decides to open a business to find income to raise her children. This was the case during the 1994 genocide in Rwanda which left behind many widows and orphans.

Table 2.3: Push motivational factors to women to start a business in Kigali

Factors	**Motivation**
Divorce or Separation	Divorce or separation can push one partner to start a business. For instance, when only one person works in a family and divorce happens, there is not another way to find income. In this situation, she decides to start a business to continue to survive (Mahadea & Youngleson, 2013).
Finance	Some women work, but they earn little income, they decide to resign to join entrepreneurship. They believe that by opening their own business, they can generate more revenue and improve their lifestyle (Hirwa, 2010; Vis, 2012); Hakuzimana (2017) adds that challenges of family finance push women to entrepreneurship to supplement their husband's income.
Job dissatisfactions	A person is not happy with a job, for instance, lack of promotion when she supposed to move to a higher position; dispute with bosses; discrimination, short-term contracts, and so on. She decides to leave the job to start a venture on her own (Nieman et al., 2003; Mahadea & Youngleson, 2013).
Maltreatment	At the workplace a person feels marginalised, discriminated against; she/he cannot cope and continue to work in that environment, and she/he decides to quit the job to open a business where she/he can be independent and self-employed (Nieman et al., 2003; Mahadea & Youngleson, 2013).
Unemployment	Some females in Kigali do not have jobs, for instance, graduates do not have a chance to obtain employment in the labour market, they do not have another option to generate income, this situation of unemployment pushes them to start a business. Other females may lose a job due to a recession for instance; they cannot find another job, so they decide to join entrepreneurship to generate income, they can continue to assume their responsibilities like before when they worked (Malunda, 2011; Vis, 2012; Hakuzimana,

	2017). However, the high rate of unemployment hurts society and the country in general. The unemployed are sometimes involved in crime to have money. It is essential that government and stakeholders work together the create jobs, encourage and support entrepreneurship. Introduction of innovation is one of the key characteristics of job creation and sustainable business (Maas & Herrinton, 2006; Ajimotokin, Haskins & Wade et al. 2015).
Widow	The death of a breadwinner in a family pushes the widow or orphans to start a business when they do not have another option to generate income. They are forced to launch a venture to fulfil their needs. The Rwandan Genocide in 1994 led to a considerable number of men being killed; families lost almost everything. Women had to raise children and keep them in school. They were pushed to business for their families to survive. Perhaps, this is why after 1994 the number of women entrepreneurs increased dramatically in Rwanda particularly in Kigali city (Unated States of America. USAID, 2009; Lionnesses of Africa, 2016).

2.7.3 Pull motivation factor

Pull is an action to attract someone or something or thought to a position of the puller. Pull factors in entrepreneurship refer to a person who views the opportunity in entrepreneurship (opportunity entrepreneur) to fulfil her business ambitions. She is pulled by an opportunity to start a business with the objective to grow a business to a higher level (Amit & Muller, 2013; Mahadea & Youngleson, 2013). Moreover, Pulled entrepreneurs do not limit their ambitions on business like pushed entrepreneurs, they also need to be visible, influence the community and administration decision making. They have creative and innovative drive. Women entrepreneurs shaped with pull motivation factors could identify an opportunity at a micro, small, medium, or large business. Interestingly, a well-exploited opportunity can move a business to a higher size level. For instance, an opportunity identified and exploited effectively at micro-enterprise can be promoted to small or medium or even to a large business (Erasmus, et al., 2015; Martel, 2019).

Many authors (Vis (2012); Twahirwa (2014); Lionnesses of Africa (2016), and Hakuzimana (2017) identified that independence, fulfilment, self-actualisation, innovation, prestige, recognition, wealth, education, and self-employment were the pull motivation factors for women to launch new enterprises in Kigali (See Table 2.4). Table 2.4 indicates how each pull factor stimulated women entrepreneurs to launch their enterprises in Kigali.

Independence was one pull motivation factor that attracted women-owned SMEs in Kigali to start businesses. Many women decided to open a business to be independent. Others wanted to fulfil their entrepreneurship ambition of running a sustainable business. Self-actualisation and motivation, coupled with a high level of achievement drove the business to sustainability and enabled them to have an influence in the community. Due to their work experience, some of the women innovated new products or services and resigned to pursue the opportunity.

They launched businesses to introduce new products or services in the Kigali market and maximised the profit. Prestige, recognition, and wealth together motivated them to start businesses to be more visible, respected, rich, and contribute to the community. Education is known as a catalyst to entrepreneurship and some women were motivated by their education to launch businesses in the field of their studies. Some women opened a business to be self-employed rather than working for others. They believed that being entrepreneurs, they were more socially and economically stable than working for someone else.

Table 2.4: Pull motivational factors to women to start a business in Kigali

Factors	Motivation
Independence	Some people start and manage owner-businesses. They perceive entrepreneurship as a career; they are tired of working under pressure for others. They need the freedom to achieve their ideals. They believe that entrepreneurship provides opportunities and it can change their lifestyle. They organise the time and job as they want, without consulting anybody else; they are responsible for their own business (Vis, 2012).
Fulfilment	Fulfilment factor drives an entrepreneur to achieve her business ambitions. She works hard to satisfy the needs and wants of consumers and at the same time grow the business to gain competitive advantage. Entrepreneurs are proud of their business activities (Lionnesses of Africa, 2016).
Self-actualisation	Self-actualisation factors makes a person set goals and objectives to attain. Despite the challenges in the business lifecycle, she works effectively and efficiently to achieve those goals and objectives assigned. She is proud of the business impact on society. Self-actualisation is the catalyst for innovation (Nieman et al., 2003; Mahadea & Youngleson, 2013).
Innovation	Innovation is a new product or service that has not been on the market before; it can also be a product added value (Frynas & Mellahi, 2015). Some people are innovators, shaped with skills to bring new products or services to the market that improves lifestyle.

	Being entrepreneurs allow them to realise their creativity, put their innovative ideas into a vital product or service. Literature indicates that employees may identify an opportunity, she resigns and joins entrepreneurship where she launches new products or services (innovation) on the market (Mahadea & Youngleson, 2013).
Prestige, recognition, wealth	Being self-employed and running a successful business increases respect and value in the community particularly women; contributing to community development, society benefits more from the business and recognises the importance of an entrepreneur. The industry can solve the financial issues of an entrepreneur; achieve her prosperity ambitions (Nieman et al., 2003; Mahadea & Youngleson, 2013). Push and pull motivation determines the type of entrepreneur as a necessity and opportunity entrepreneur. Both entrepreneurs are discussed below.
Education	The literature indicates that education plays a critical role to encourage women to open a business in their field of study. Indeed, education improves women confidence, and they feel the same abilities to do things like their counterparts, men.
Self-employed	Women changed their way of thinking, and they endeavoured to grow in entrepreneurship. The work of Hirwa (2010) reveals that women heard the government encouraging them to create their owner-businesses rather than waiting for work in the labour market. Interestingly, some women discovered an opportunity, and they opened a business to exploit this opportunity (Vis 2012; Hakuzimana, 2017).

In the introduction of literature review, the sub-research question addressed was "What are the socio-economic factors influencing women in Kigali, Rwanda to join entrepreneurship?" and the purpose of the question was to identify the socio-economic factors influencing women in Kigali, Rwanda to join entrepreneurship. Push (divorce or separation, finance, job dissatisfaction, maltreatment, unemployment, and widowed women) and pull (independence, fulfilment, self-actualisation, innovation, prestige, recognition, wealth, education, and self-employment) are motivational factors that stimulated women to start businesses in Kigali. However, the type of businesses related to push and pull motivation was not highlighted. Therefore, the next section emphasises necessity entrepreneurs as the one’s who pushed to move forward despite negative situations and started their business to generate survival income. On the other hand, opportunity entrepreneur launched businesses intending to grow, to realise their entrepreneurship ambitions.

2.7.4 Necessity versus opportunity entrepreneur

The previous two sections described push and pull motivation factors as a catalyst to women entrepreneurs to start businesses in Kigali. Women entrepreneurs shaped by push factor motivation are also called necessity entrepreneurs because survival was the objective of starting businesses. In contrast, pull factor motivation is linked to opportunity entrepreneurs who had entrepreneur intention and the ability to pursue the opportunity identified. They started a business to conduct a sustainable business. There is a solid connexion between motivation and launching of new businesses among women-owned SMEs in Kigali.

Figure 2.5 summarises the factors motivating a person to start a necessity and opportunity business as discussed above. It helps a reader to comprehensively and quickly identify the difference between necessity and opportunity entrepreneurs and their motives toward entrepreneurship. The researcher summarises the text into a figure form for ease of reference and understanding. Indeed, this figure also answers the question “What are the socio-economic factors influencing women in Kigali, Rwanda to join entrepreneurship”? It reaches the objective related to this question above by identifying push and pull factors motivating inspired women entrepreneurs to start businesses in Kigali. Also, the figure shows the relationship between motivation and business creation. The figure presentation starts with motivation toward entrepreneurship, it shows on the left-side push factors such as divorce, finance, job dissatisfaction, maltreatment, separation, unemployment, and being widowed that leads to necessity entrepreneurs who started businesses due to lack of another source of income to survive. On the other hand, pull factors such as education, fulfilment, independence, innovation, recognition, self-actualisation, prestige, and wealth drive an opportunity entrepreneur. They were already in an occupation and socially and economically stable however, they identified an opportunity. They started businesses to pursue the opportunity, fulfil their business ambition of running a sustainable business.

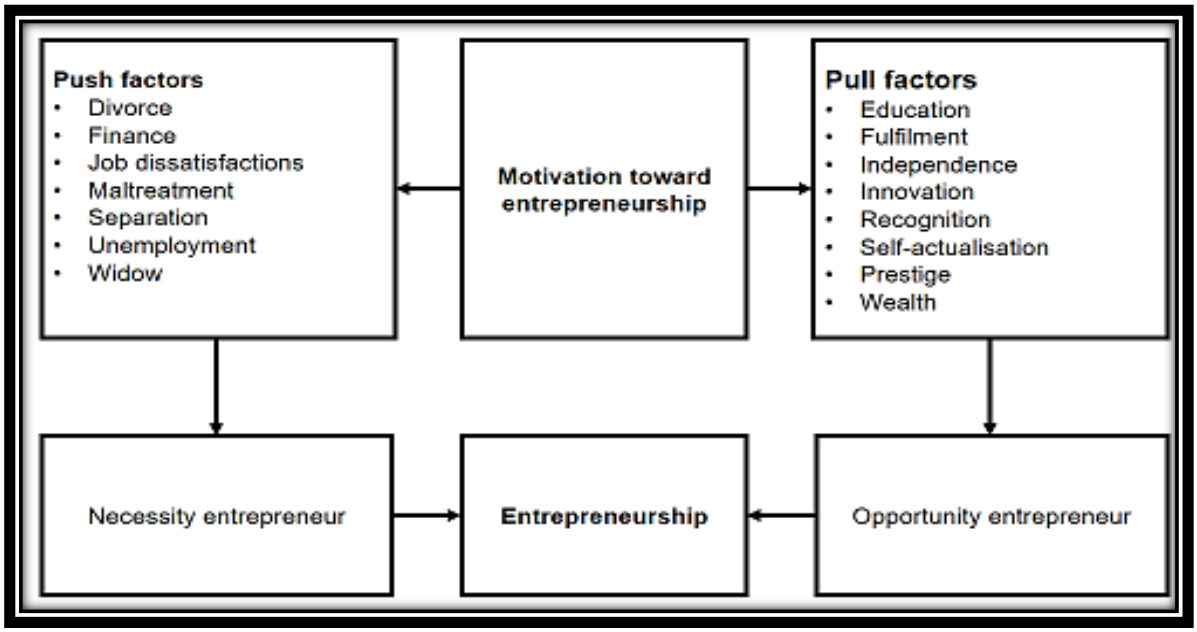

Figure 2.5: Women motivation factors towards entrepreneurship in Kigali (Researcher, 2018)

Women necessity entrepreneurs in Kigali are those who were influenced with push factors (divorce/separation, finance, job dissatisfaction, maltreatment, unemployment, and widow) to start businesses. Most of the time, their businesses are small-sized, selling convenience products or services compared to opportunity entrepreneurs. They rushed into business because they do not have another source of income. They may leave the business industry anytime they find a job in the labour market; they are not interested in creativity and innovation. They are worried about obtaining daily income to survive (United State of America. USAID, 2009; Hirwa, 2010; Donna et al., 2011; Vis, 2012; Hakuzimana, 2017).

In contrast, women opportunity entrepreneurs in Kigali were those inspired with pull factors (independence, fulfilment, self-actualisation, innovation, prestige, recognition, wealth, education, and self-employment) to launch businesses as indicated in Figure 2.5. The business was their passion; they seek to see their enterprises growing and becoming sustainable. They believed that ICT is the centre of creativity and innovation to improve business performance, productivity and competitive advantage. Their businesses tend to be bigger, compared to those of necessity entrepreneurs (Twahirwa, 2014; Lionnesses of Africa, 2016; Hakuzimana, 2017).

Opportunity entrepreneurs commence business professionally to penetrate the market. They do not struggle with capital start-up; they hired employees, and their

income was higher compared to necessity entrepreneurs (Nieuwenhuizen & Nieman, 2014), contrary to necessity entrepreneurs who started small-size businesses with little start-up capital borrowed from family or friends. They run a business alone, and their income is lower, compared to opportunity entrepreneurs (Fairlie & Fossen, 2017). Interestingly, few necessity entrepreneurs succeed and progress to opportunity entrepreneurs (The Manila Times, 2017).

The literature indicates that push and pull motivation were behind the reasons women started necessity and opportunity businesses in Kigali. Therefore, the first hypothesis identified and cited

H_1: There is a positive relationship between motivation and new women enterprises creation in Kigali, Rwanda.

As seen above, push and pull motivational factors stimulated women to start businesses in Kigali. However, they may face constraints in doing business in Kigali. Thus, the next section addresses the probable constraints experienced by women owned businesses.

2.8 Potential constraints facing women-owned small and medium businesses in Kigali

The previous section focussed on the push and pull motivation factors toward entrepreneurship among women in Kigali and the types of business they started. This section emphasises the probable constraints faced by women-owned SMEs in Kigali. It responds to the second sub-research question "What are the constraints experiencing women entrepreneurs in running small and medium businesses in Kigali, Rwanda?" The objective of this second sub-question was to identify the constraints experienced by women entrepreneurs in running small and medium business in Kigali, Rwanda. By doing so, the probable constraints facing women-owned SMEs in Kigali are identified and discussed. These constraints are regrouped in five categories, respectively, gender inequality constraints; financial constraints; government constraints; skills constraints, and own fear constraints. Each group will be explored in the different sections below.

Table 2.5 shows the potential constraints women-owned SMEs may experience in doing business in Kigali. One of the most significant constraints is gender inequality; it encloses the constraints related to gender that confronted women-owned SMEs in Kigali in their dairy businesses activities. These constraints are gender inequality, cultural norms, and inadequate access to finance, physical mobility, family responsibility, and sexual harassment. The second group represents the constraints linked to finance, including high-interest rates and lack of collateral to secure loans.

The third group related to the government constraints, comprises access to government services, corruption from government officials, high tax rates, high transport costs, and high cost of telecommunication, networking, business competition, and lack of market. The fourth group contains their fear; it covers the Human Immunodeficiency Virus (HIV) and Acquired immunodeficiency syndrome (AIDS) and fear of failure. The final group is skills constraints and the lack of entrepreneurship skills, lack of training and education, and lack of Information and communication technology skills. These constraints facing women-owned SMEs in Kigali are discussed chronologically in section.

Table 2.5: Potential constraints facing women-owned SMEs in Kigali

Gender inequality constraints
Gender disparity
Cultural norms
Inadequate access to finance
Physical mobility
Family responsibility
Sexual harassment
Finance constraints
Lack of collateral
High-interest rate
Government constraints
Access to government services
High tax rates
Corruption from government officials
The high cost of telecommunication
High transport cost
Inadequate access to networks
Business competition
Lack of market
Own fear
The Human immunodeficiency virus and acquired immunodeficiency syndrome
Fear of failure
Skills constraint
Lack of entrepreneurship skills
Lack of training and education
Lack of Information and communication technology skills

2.8.1 Gender inequality constraints in businesses

This category of constraint facing women-owned SMEs in Kigali hinders access to their rights. Consequently, these constraints affected women SMEs negatively in Kigali, and as a result their businesses were small in size. The constraints of this category are gender disparity, cultural norms, and inadequate access to finance, physical mobility, family responsibility, and sexual harassment and will be discussed in the following section.

2.8.1.1 Gender disparity constraint

According to Newman (2018), gender refers to the role a male or female plays in society. The researcher maintain that the issue of gender in business becomes problematic when one of gender (male or female) is treated differently compared to another as this engenders inequality. In many developed and developing economies, society provides men with advantages, while discriminating against females. These occur in economic, education, entrepreneurship, politics and workplace (United Nations Development Programme (UNDP), 2018). Therefore, there is vast gender inequality in businesses in Rwanda, particular in Kigali, where the majority of businesses belong to male entrepreneurs who also capture public and private procurement. This is due to the Rwandan society underestimating womens' ability to run and grow a business. However, there is no scientific evidence to confirm the inability of women to manage the business, supply and leaning.

The underestimation of womens' capacity is based on the stereotypical behaviour, patriarchy, and cultural norms in the country. Male-dominated Rwandan society believe that entrepreneurship is for men and women should occupy housekeeping activities and depend on men (Byanafashe et al., 2011; North Carolina State University, 2018). Consequently, women-owned SMEs in Kigali could not receive appropriate support from the society and access to resources. Therefore, 96% of them conduct micro-enterprises which are the smallest size business among sole proprietor enterprises (Rwanda. National Institute of Statistics of Rwanda, 2018).
In contrast, hegemonic masculinity defines how men positioned in society enable them to obtain and retain superiority over women. Males are more likely than females to conduct business.

Thus, their dominance is a natural phenomenon not a matter of entrepreneurship gender divide (Connell & Messerschmidt, 2005:852; Eddleston & Powell, 2012).
Nevertheless, there is a possibility to grow women-owned businesses in Kigali, while decreasing the gender entrepreneurship gap, if public and private sectors involve more women in procurement. Awarding public and private tenders to women in supply chain management will increase women involvement in the mainstream economy. However, calling them to contribute fully in mainstream economic without privileges will continue to keep them behind, running informal and small-sized businesses (Muhire, 2018; Pro-Femmes /Twese Hamwe, 2019).

Gender has marginalised women from launching businesses in Kigali. It can further be argued that culture contributed to undervalue the role a female can play in starting, running, and growing a business. Indeed, many women have entrepreneur intention, but they lack family or society support; they are discouraged from launching a business. Those who managed to open businesses, have small-sizes enterprises compared to their male counterparts and are struggling with market competition to grow their businesses. The next section discusses culture as a constraint facing women-owned businesses in Kigali.

2.8.1.2 Cultural norms constraint challenging women-owned businesses in Kigali

Culture refers to norms, beliefs, customs, and ideas to guide a particular society. However, most of the disadvantages Rwandan women face stem from the cultural norms (Mbabazi, 2018). Cultural norms still challenge women when opening a business; they must first ask permission from the family or husband to start and run a business. Lack of family support stops many women entrepreneurship ambitions (Muhoza, 2019). However, those who break the glass ceiling to start enterprises, work under cultural norms and pressure that impacts on their SMEs' performance and growth. Therefore, in most instances they manage small scale businesses. Cultural norms challenge women in the business environment while men do not embrace integrating women in entrepreneurship particularly in Kigali (Brooks, 2018).
In Rwanda, suppliers prioritise men entrepreneurs. Due to the Rwandan cultural beliefs some male consumers are still conservative and they do not buy products or services from women when they can find it from men-owned businesses.

They still believe that business is a man's job and perhaps they do not support women's businesses because they fear losing control over women when they become prosperous and economically independent (Brooks, 2018; Muhoza, 2019).

In some cases married women that own businesses in Kigali complain of not having full control and decision making in their businesses. Their husbands still wear cultural clothing to decide how the business should be run, and capital used, even if husbands do not have shares and knowledge in the business. They spoil working capital that weakens businesses competitiveness and growth and this keeps the business small scale (Hirwa, 2010; Vis, 2012).

Rubio-Bañóna and Esteban-Lloret (2016) accuse the society to take a negative side of culture to address women entrepreneurship issues. However, both side negative and positive should be considered to build solid entrepreneurship in which fit men and women entrepreneurship in national culture context respect.

Despite the cultural constraints experienced by women in Kigali, they also face difficulty in accessing finance. This will be discussed in more detail in section 2.8.1.3.

2.8.1.3 Inadequate access to finance constraint

Finance in this study refers to money or credit women-owned SMEs in Kigali may use to start, run and grow their SMEs. Inadequate access to finance occurs when they cannot acquire enough money needed to conduct SMEs. Access to finance is a common issue for men and women in developing economies like Rwanda; it is worse for those in the informal sector, small-sized, and women-owned businesses. However, given the opportunity for women to access finances may help them grow their businesses, improve their competitiveness, market share, increase GDP, and close the financial inclusion gap. Lack of access to finance means that women SMEs will continue to suffer financially and this may result in them remaining small-sized enterprises (Rukundo, 2015).

Yunus (2003) the Noble Peace Prize laureate believed that there is no sustainability socio-economic development when women cannot access the resources, such as finance and training. In his study on Jobra Village in Bangladesh, he discovered that

facilitating women farmers accessing capital and empowering them on know-how could produce four times their harvest, add the value of their production, and sustain their enterprises.

Women have fought for financial inclusion in Rwanda, however, access to credit is still a constraint in growing their businesses. Furthermore, loan application processes are much easier for men compared to women, and most women own small-sized businesses that banks consider as a higher risk. It is tough for women to share the market and compete with men who have facilities to access capital (Flaherty, 2017).

Contrary to Bangladesh, banks like Grameen Bank ensure that at least more than half of the borrowers are women, particularly women entrepreneurs. This has impacted women's social-economic development in Bangladesh and decreased the gender financial inclusion gap (Yunus, 2003).

Lack of finance has a negative impact on women SMEs in Kigali and some of them go back to conduct informal businesses which require small capital and are tax free (Rukundo, 2015). The FinScope Rwanda (2016) report indicated that in terms of the financial inclusion in Rwanda, women are at a disadvantage in accessing finance compared to men.

Alliance for Financial Inclusion (2014) viewed that the Community Savings and Credit Cooperatives SACCO UMURENGE, which has branches in countrywide, provides the same loans opportunity for men and women entrepreneurs. He advised women entrepreneurs to take loan advantage from SACCO UMURENGE.

Figure 2.6 compared gender finance inclusion in Rwanda in terms of bank, non-bank, informal, and excluded finance inclusion. The statistics show that financial inclusion in banks result in men profiting at 29% versus 24% for women. In other formal financial institutions, men dominate with 45% versus 39% for women. In contrast, women are more likely to access informal finance with 24% versus men at 17%. A higher percentage of women (13%) do not access any form of finance as compared to 9% of men.

FinScope Rwanda (2016) concluded that disadvantaged access to capital impacts on the creation and growth of women SMEs, and most women use the informal loan to run businesses. This form of finance is not guaranteed, and most of the time, it is short and demands higher interest, which results in anxiety in women-owned SMEs in Kigali.

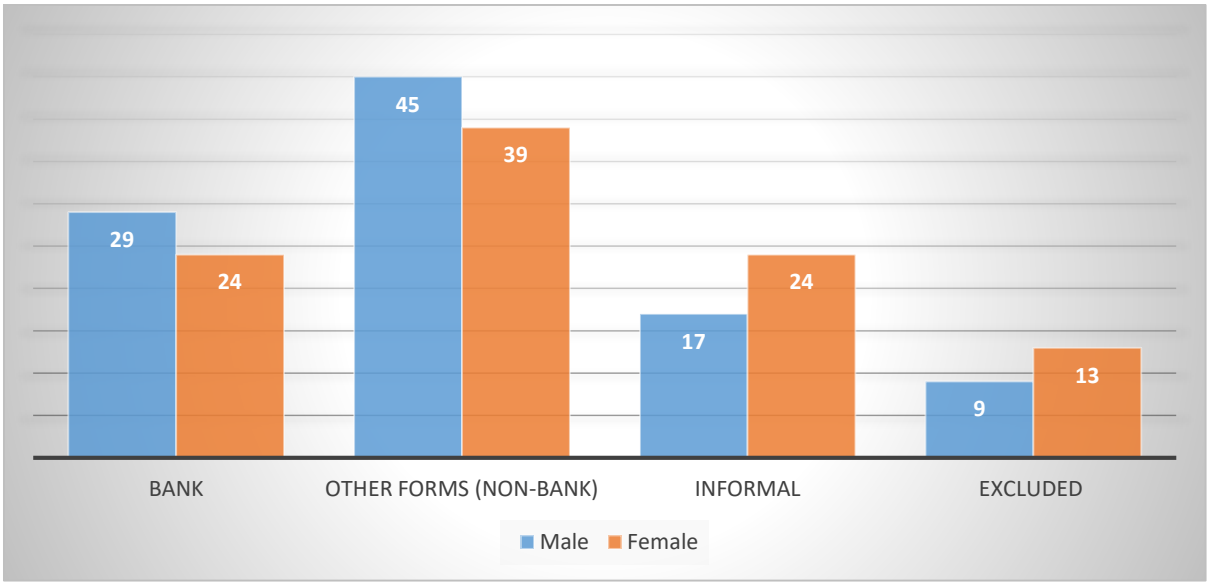

Figure 2.6: Rwanda gender finance inclusion in percentage (Adapted from FinScope, 2016)

However, few women-owned SMEs in Kigali had a chance to obtain loans from commercial banks. Interestingly, most of them managed to grow their businesses and met the deadline to pay back the money. Some of them reimbursed loans before the deadline that indicates how women entrepreneurs in Kigali are honest with regards loans. This is contrary to many men entrepreneurs who use loans to upgrade with luxury possessions, for instance cars (FinScope Rwanda, 2016; Rwanda. National Bank of Rwanda (2019).

In Bangladesh, Grameen Bank's flexibility to lend women resulted with new massive women enterprises creation, over 68% of women cross the poverty line. They showed the honesty in reimbursement of loan makes a high rate of around 98.4% repayment (Yunus et al., 2010:308).

To find a sustainable finance inclusion solution for women-owned businesses in Kigali, government and stakeholders created different initiatives. However, the majority of women do not access these funds. This is attributed to nepotism, the large enterprises welcomed and enjoyed funds to sustain their businesses which are already

established. Women SMEs in Kigali need funds to grow their businesses (Bazubagira, 2011; Kwibuka, 2015). They should not be underestimated because they are women and they should be awarded the opportunity to also run medium and large businesses instead of conducting small-sized business due to lack of adequate access to finance. Despite the access to capital women also experience physical mobility challenges and these will be discussed in section 2.8.1.4.

2.8.1.4 Physical mobility constraints

Physical mobility refers to moving around in the environment (Kelley et al., 2017). The Rwandan culture attributes women to housekeeper tasks. Those who have a chance to open and run businesses face a constraint of free mobility. This is due to husbands and families who do not allow females to travel in order, for instance, to meet networks, buy cheap stock, and identify a niche market. Negating mobility of women-owned SMEs in Kigali exposes their businesses to becoming uncompetitive. In some instances where women are not permitted to travel to buy products, they rely on the distributor and wholesales whom most of the time sell directly to the consumers. This makes pricing difficult for women-owned SMEs in Kigali, and the profit is minimal. Refusing women mobility retains the gender equality gap (Mukamana et al., 2017).

To illustrate how physical mobility constrains women-owned businesses in Kigali, the researcher used the dairy industry case. Milk is one of the most consumable products in Kigali. Women own almost half of the retail milk shops in Kigali. However, none of these women are distributors. Consequently, they sell a small quantity of milk, and their profit is smaller compared to their counterpart men. Rwanda Dairy's Board (RDB) welcomed women to distribute milk; they can earn more and sell a large quantity. However, the transport of milk is done during the night, and although women-owned SMEs physical mobility during the day is limited, it is worse at night. It has been reported that women are not allowed to travel during night to take advantage of milk distribution under the pretext of home responsibility (Blackden et al., 2011).

Another reason cited for restricting physical mobility of women is to protect them from abuse and rape during the transportation, which often happens. Nevertheless, it impacts their businesses negatively as they are forced to buy expensive inventory from distributors and wholesalers from which they make very little profit. Limiting women

mobility, benefits men entrepreneurs and enhance entrepreneurship and the gender inequality gap. It keeps women running only small-sized enterprises (UNCTAD, 2014). There many incidents associated with travelling particular at night. Partners and families who restricted women travelling should not be considered as an obstacle for women businesses rather protective as they support women businesses in other ways (Jacobson & Joekes, 2019). Husbands and families limit women-owned SMEs in Kigali under the excuse of family responsibility, which is debated in the next section.

2.8.1.5 Family responsibility constraint

Rwandan culture attributes women to housekeeping tasks**;** they must make sure everything in the family and home is in order. In an interview Kantengwa (2016) conducted with the president of RCWE; she recognises the change women are making to enter entrepreneurship. However, family responsibility is still a constraint to them due to some husbands and families not supporting them by helping to perform home duties. They have to balance business and home responsibility. Remarkably, combining home responsibility and running a business strengthens womens' entrepreneur management capacity to efficiently manage different functions at the same time (Kelley et al., 2017).

Mukama (2017) observed how women-owned SMEs in Kigali dedicate time on business to ensure the growing process. They are tired and still have to check on children and help with homework. They are also expected to cook and serve their husbands as culture stipulates. In Kigali, women that own businesses often experience challenges with their social relationships. Their community, friends, and relatives complain that they do not have time for them due to their business commitment (Mukama, 2017). However, Nieman, et al. (2003); Barringer and Ireland (2008); Rwigema et al. (2008), and Erasmus, et al. (2015) agreed that running a business requires that an entrepreneur works more possible hours to maximise profit. But, women-owned SMEs in Kigali work a few hours a day compared to their counterparts men because they rush home to assume their family responsibilities. Therefore, fewer working hours affect their income and this delays the growth and sustainability of their SMEs. The next section discusses another important constraint faced by women SMEs, sexual harassment.

2.8.1.6 Sexual harassment constraint

Kabagambe (2019) defines sexual harassment as an unwanted sexual demand in exchange for an opportunity, for instance, job, school, exam marks, promotion, and business opportunity. He adds that verbal or physical threats based on gender are also included in the sexual harassment definition. Sexual harassment can be traced back to gender stereotype, where men dominate women, and men continue the same behaviour in the workplace and business environment. Many women have been victimised while running a business. For instance, in the tourism and hospitality industry in Kigali, women entrepreneurs face sexual harassment including verbal abuse, unwanted touch, rape, among others (Tashobya, 2016; Mbabazi, 2018).

Transparency Rwanda (2011) reported that some women entrepreneurs in Kigali meet the requirement to win public tenders, but they fail due to corrupted public officials who request sexual acts in exchange for tender. Many females that have been harassed prefer to keep quiet instead of saying what happened to them as they fear not being believed and rejected in society. Despite the Law N°59/2008 of 10/09/18 punishing those who are involved in sexual harassment, culture still confines Rwandan women, they keep quiet when harassed (Rwanda, 2008).

The New Times (2019) found it challenging to achieve a sustainable sexual harassment solution as Rwandan culture views discussions about sex as taboo. Sexual harassment has many consequences on women-owned SMEs in Kigali. Many females prefer managing small-sized businesses as a result of fear of sexual harassment when engaged in opportunity. Despite the sexual harassment, women-owned SMEs in Kigali were also experiencing financial problems which are emphasised in section 2.8.2.

2.8.2 The Financial constraints for Rwandan women entrepreneurs

The previous section described the gender inequality constraints facing women-owned SMEs in Kigali. This section focuses on financial constraints in terms of lack of collateral and high-interest rates.

2.8.2.1 Lack of collateral constraint

Lack of collateral to secure a loan is one of the significant reasons for inadequate access to finance for women-owned businesses in Kigali. Collateral is something valuable, an asset used to secure or obtain a loan. If the borrower fails to pay back the loan, the lender can seize the collateral to make up for the loss (Kagan, 2019). Collateral is a big issue for women-owned SMEs in Kigali. The finance institutions target properties and land as a guarantee to obtain a loan which many of women-owned SMEs in Kigali do not have (Rwirahira, 2018). Rwandan culture did not allow women to own property and inheritance. Nevertheless, a few years ago, this changed. Women have to ask someone else for collateral to obtain a loan which is usually impossible, and most husbands refuse collateral to their wives. Husbands do not trust wives' ability to run a successful business; they believe that giving wives collateral for the guarantee puts it in danger (Flaherty, 2017).

Many lenders underestimate women's ability to invest money and look for reasons not to provide them with loans. Those who have collateral receive a small amount of money compared to what they applied for. Consequently, they have to adjust their business plan to a little loan received, which impacts their business growth and competition (Flaherty, 2017). Furthermore, banks refusing loans to women, delays socio-economic development in countries. This is another form of discrimination that women face in entrepreneurship. Many women are barred from realising their business dreams; they are a victim of a lack of asset for collateral (Bugingo, 2018). Lack of collateral to access finance justifies the reasons why many women entrepreneurs in Kigali run micro-enterprises. Furthermore, high-interest rates is another constraint that emerges as women engage in their businesses.

2.8.2.2 High-interest rate constraint

Interest is the money a borrower adds on the amount borrowed. The money is paid back with interest. It is a benefit of a lender. In Rwanda, business regulations are flexible, and it is ranked second after Mauritius in doing business in Sub-Sahara Africa. However, the interest rate is high, with an average of 18% (World Bank, 2019). In South Africa the interest rate is flexible (10%) and women entrepreneurs are enjoying it to start and grow their businesses (Bracher, 2019).

Therefore, a flexible interest rate attracts local and foreign investors. As a result, new jobs are created, decreasing the unemployment rate, increasing GDP and lifting social and economic development (United States of America Department of Commerce, 2014; World Bank, 2019). High-interest rate challenges women-owned SMEs in Kigali and most loans are short-term with no grace period. These women start to reimburse monthly, immediately after obtaining a loan and this affects their business grow. It is challenging to grow SMEs, particular start-ups with high-interest rates, coupled with short-term repayment (Ruhara et al., 2018; Rwirahira, 2018). Ipsos Strategic Marketing (2011) reports that in Montenegro, financial institutions provided a year grace period to women entrepreneurs that helped them to have enough time to use money and implement their strategies and grow their businesses.

This is in contrast to Rwanda where reimbursement starts just after launching an enterprise. A considerable number of women SMEs in Kigali collapsed due to the high-interest rate associated with lender pressure to refund money in the short-term. Some preferred to reinvest cash flow, but it is not enough to grow a business. Unfortunately, women SMEs remain small-sized compared to those of men entrepreneurs in Kigali (Ruhara et al., 2018; Rwirahira, 2018).

The Rwandan lenders should learn Montenegro's best practice and give women entrepreneurs the time to invest the money instead of taking cash outflows immediately to repay the loan. Therefore, the decrease in the interest rate and extension of the reimbursement period might boost women SMEs in Kigali and other provinces. Doing so, women SMEs might be sustainable, having more money in circulation, many people could open businesses, and financial institutions could take advantage to lend money to more people which will increase their wealth. It could also increase public revenues and accelerate socio-economic development (Bugingo, 2018). The next section highlights government constraints.

2.8.3 Government constraints facing women-owned SMEs in Kigali

The previous section discussed financial constraints facing women-owned SMEs in Kigali. This section highlights the government constraints such as access to government services, corruption from government officials, high tax rates, high

transport costs, and high cost of telecommunication, networking, business competition, and lack of market. The discussion begins with women-owned business's access to government services.

2.8.3.1 Access to government services constraint

Starting and running a business in developed and developing economies start with business registration. In Rwanda, three days are sufficient to register and start operating a business. The registration is completed online and considering that many women-owned businesses in Kigali are not familiar with the use of the computer and Internet, they struggle to register their businesses online. The administration did not consider opening an office that can assist women in registering their businesses, paying taxes, and other services related to their business. However, online registration is quick, less time consuming and cost effective compared to traditional paperwork business registration (WB, 2019). Despite the quick business registration many women-owned businesses in Kigali complain of strong business policies that cause them to discontinue their businesses and try the job on the labour market (Ruhara & Kayitana, 2018). While it is difficult for some women entrepreneurs to access the government services, others complain about bribes demanded by some government officials in exchange for service. The next section highlights the corruption constraint.

2.8.3.2 Corruption from government officials

According to Transparency International (TI), corruption is anything given unlawfully to an official to obtain something valuable which the giver should not obtain in the normal process. Corruption can be money, presents, sexual, and so on (TI, 2018). A recent study conducted on corruption in the public sector involved experts and entrepreneurs and ranked Rwanda 48th from over 200 countries that participated in the study, and third in Africa after Botswana ranked 34th, and Cape Verde ranked 45th globally (TI, 2018). Corruption gangrenes the economics of the country, promotes nepotism, while disadvantaging others. For instance, many women-owned SMEs in Kigali could not integrate into a public supply chain that could improve the market share to grow their businesses.

Despite the Rwanda government battle against corruption, some public officials still demand bribes from women-owned businesses in Kigali in exchange for services and market in supply chain management. However, women are less corrupted compared to men. It is the reason perhaps some officials do not give women entrepreneurs public tender due to the fear that they cannot corrupt them and rather denounce them. Corruption and nepotism favour the wrong entrepreneurs in obtaining tender; consequently, they cannot perform the work correctly which can cost extra expenses and time to meet the standards (Karuranga, 2018). These corrupted officials also harass them. Therefore, women-owned SMEs in Kigali are victims of sexual harassment in the business environment; among others, they need protection (Transparency Rwanda, 2011). The following section emphasises heavy tax constraints experienced by women-owned businesses in Kigali.

2.8.3.3 High Tax constraint

Mohr and Louis (2008) *define tax as levied on (and paid by) households and firms.* The high tax rate discourages women entrepreneurs in Kigali to move forward to the formal sector; some of them prefer to run informal businesses due to the fear of various taxes (Rukundo, 2015). Rwirahira (2018) reported that women SMEs could not survive the higher taxes tariff, particularly those running SMEs in Kigali as they have other operating business expenses. This is why some of them shift from formal to informal businesses which are not registered to pay taxes.

On the other hand, those who have financial power create companies which enjoy tax flexibility and other government incentives. Hampel-milagrosa (2009) and Ndisanze (2017) claim that there is no transparency to count the taxes to be paid, and sometimes taxes are more than annual income, and some of the government officials are corrupted. As a result, women businesses could not progress, rather they stagnate to small-sized enterprises. Some of the women SMEs in Kigali closed down due to complex taxes.

Rwirahira (2018) noted that the statistics report women-owned SMEs in Kigali success, but they report one side of reality. Women-owned cooperatives in Kigali face unsurmountable challenges and often experience business failure or stagnation due to high tax rates. They pay 30% corporate taxes, plus 18% Value-Added Tax (VAT). It is

difficult, even impossible to grow a business while paying 48% in taxes. Besides, businesses have other expenses. Therefore, complex taxes constitute a significant constraint that inhibit the progression of women-owned SMEs in Kigali. This section focused on taxes as a constraint to women-owned SMEs in Kigali; the following section highlights the telecommunication constraint.

2.8.3.4 The high cost of telecommunication constraint

Telecommunication is very important in many fields of life, including social and business. United State of Amerca. National Research Council (2006) defines telecommunication as an act of exchange communication in the distance between people or software using technology. Vickery et al. (2004) report that the telecommunication cost of the cellphone is high compared to landline (fixed phone); however, due to poor infrastructure fixed phone is limited and concentrated in towns. The New Times (2013) reported that entrepreneurs in Kigali city complain about communication price hikes.

Despite these mobile phone companies on the market, there is no price war in their strategies. High communication expenses cause local businesses to suffer, particularly those of women-owned SMEs in Kigali who operate small working capital, it takes away more money which should be used to position and grow the business. The New Times (2016) argued that the decrease of subscribers and complaints of clients in relation with higher telecommunication price particularly cellphone calls pushed telecoms companies to revise their prices. However, women entrepreneurs in Kigali viewed that price cuts are still small to enjoy digital communication doing business in Kgali.

High telecommunication fees delay the growth of their businesses. Despite the expensive local calls, the international calls are wasted. The reason is that the call transits through Europe and comes back to Africa even if the countries are neighbours. Those Europeans countries charge for every single call made. Perhaps, the international calls might decrease the price if there is direct communication between African countries. Therefore, improving telecommunication infrastructure among African countries might enable them to communicate directly between them, which will cut telecommunication costs (Nsengimana et al., 2018). In the world of business,

communication and transport interact together. The next section discusses transport constraints experienced by women-owned businesses.

2.8.3.5 High transport cost constraint

Todaro and Smith (2012) argue that road infrastructures influence pricing. Despite different types of transportation, the road is the most used distribution channel women-owned SMEs in Kigali use. Due to poor road infrastructure, transport cost becomes high and the delivery time extends. High transport cost challenges the business growth. Women-owned businesses in Kigali spend more capital operating the transport of merchandise which should be reinvested into the business to sustain. Many women entrepreneurs in Kigali operate small working capital and they do not have their transport, they rely on private carriers to move products. Expensive transport weakens working capital and compromises business growth (United States of America. USAID East Africa, 2016). The following section discusses the competition constraint.

2.8.3.6 Business competition constraint

According to Westbrook (2018), "*business competition is the process of companies and individuals competing in the same industry or field. This sort of competition applies to virtually all businesses and employees*." Women-owned SMEs in many countries do not have the same opportunity as men in accessing capital. Women businesses are small-sized selling common products or services that challenges them to compete with those of their male counterparts which are established. As a result, women try to identify untapped industries or niche markets where they will not face competition (Mandipaka, 2014).

Competition becomes a significant constraint to women-owned SMEs in Kigali, as most of the businesses are small-sized, their prices are high, and they cannot survive the competition of medium and large businesses which are shaped by high quality of products; affordable prices; financial power; know-how, and modern technology (Rwanda. Ministry of Trade and Industry, 2017).

Thus, women-owned SMEs in Kigali compete with men who dispose of enough resources (human, finance, and material) and as a result some SMEs collapse, other

progress slowly or stagnate to small-sized enterprises. Women-owned SMEs in Kigali are not only challenged with stiff competition, but there is also a lack of market to sell their products which is debated in the next section.

2.8.3.7 Lack of market constraint

The market determines the state of the business; it involves supply chain management. Economists Mohr and Louis (2008) define the market as “any contact or communication between potential buyers and potential sellers of goods or services. This contact can be personal, or it can take place using a telephone, a fax machine, a computer, newspapers, advertisements or any other means.”

Rwirahira (2018) argues that the market is a thorny constraint facing women-owned SMEs in Kigali, particular the start-ups, despite the Rwanda Development Board (RDB) assistance to provide market information, launch products on home and international market. The New Times (2017) and Rwanda. Ministry of Trade and Industry (2017) observed that local consumers prefer to buy imported products more than home ones, for instance, handcraft, clothes, and shoes. However, change of mind-set and support for home manufacturing and products may grow SMEs, create jobs, lift GDP, stimulate socio-economic development and maintain international currencies in the country.

The market is a constraint for women-owned SMEs in Kigali. Most of them sell convenience products which could be found anywhere. They do not have enough consumers to support their businesses as many wholesalers sell direct to consumers. Lack of market stifles women-owned businesses and they are forced to remain small scale. However, those who have an innovation or unique product may be advantaged as government and stakeholders work to get help for entrepreneurs to find new market inside and outside the country (Rwanda. Ministry of Trade and Industry, 2009; Shange, 2015). Perhaps, women-owned SMEs in Kigali confront lack of market due to deficiency of networks which is discussed in the next section.

2.8.3.8 Inadequate access to networking constraint

Nowadays starting and growing a business involves many factors, however, networks play a significant role in ensuring the performance, growth, and sustainability of a

business. Lack or poor networking means little productivity. Inadequate access to networks keeps many women-owned SMEs micro-enterprises. However, SMEs cannot be kept open with networks including consumers, suppliers, government, and anyone who has direct or indirect relationships with business (Misner, 2018). Rwandan males particularly those that are married restrict networking relationship for their wives, they limit them from networking and this decreases the probabilities of obtaining new opportunities and stakeholders for their businesses. However, it is challenging to run a growing business in Kigali when women cannot freely network (Bishumba, 2017).

Umutesi (2014) emphasises the importance of networking, referring to a few women-owned SMEs in Kigali who were selected to attend a Peace through Business programme training in the USA where the top global businesswomen contributed in sharing best practice and experiences with other women entrepreneurs. Interestingly, through networking, many of the constraints they faced in doing businesses in Kigali were solved through networking with global role model successful women entrepreneurs.

Mbabazi (2019) observes many women-owned SMEs in Kigali growing through networking despite the limitations imposed. Meeting the right people and learning from their best practice and integrating this into their businesses accelerates the performance of SMEs. Without access to networking, women-owned SMEs in Kigali miss valuable information and experience which could help them find opportunities needed to manage the business growth process.
Mbabazi (2019); RCWE (2019) and Trade Mark East Africa (2019) maintain that women-owned SMEs in Kigali still suffer the gender inequality and culture norms which limit them from access to networks. They strongly condemn the patriarchal, cultural norms, and stereotypical behaviour which treat women entrepreneurs as the second class population in the society and business environment. These must change. The following section explores the fear constraints facing women-owned businesses.

2.8.4 Own fear constraint facing women-owned SMEs in Kigali

The previous section discussed government constraints, this section explores the fear constraints faced by women-owned businesses including HIV/AIDS and fear of failure.

2.8.4.1 The Human Immunodeficiency Virus (HIV) and Acquired immunodeficiency syndrome (AIDS)

World Health Organization (WHO) defines HIV/AIDS in its words as *"The human immunodeficiency virus (HIV) infects cells of the immune system, destroying or impairing their function. Infection with the virus results in progressive deterioration of the immune system, leading to immune deficiency"* (WHO, 2017). According to Avert (2018), 36.9 million people globally infected with HIV, but 25% worldwide do not know their HIV status. Most of the people living with HIV are those from developing economies, and approximately 66% stay in Sub-Sahara in Africa. WHO (2018) reports that approximately 220 000 Rwandans live with HIV, among them women over 15 years old estimated at 130 000 (59%).

Therefore, female are vulnerable to HIV/AIDS, and women-owned SMEs in Kigali are included in this age group mentioned above. Some of them live with HIV/IADS that impacts on their businesses because the community stigmatises HIV/AIDS. Furthermore, many consumers do not buy products or services from infected women when they know their HIV/AIDS status due to fear of being infected. It is clear that this health concern is misunderstood as HIV does not contaminate via buying products or services (Avert, 2018).

Those who live with HIV/AIDS are isolated, discriminated, maltreated and abused from their colleague entrepreneurs. The suppliers do not treat them equally as others, for instance, they are not provided with products on credit. These increase their frustration and the feeling that they do not fit in the business world and community. Besides these, the business loses income when they are absent from work when they are sick. They spend more money to keep themselves healthy and this decreases working capital. Consequently, their businesses do not progress (Avert, 2018). While pointing out the consequences of HIV/AIDS on women-owned SMEs, they are also experiencing fear of failure.

2.8.4.2 Fear of failure constraint

Despite the effort of the Rwandan government to achieve gender parity, while encouraging culture tolerance, women are still victims of gender inequality and a

patriarchal society that affects women-owned businesses in Kigali. They live in fear of failure in running a business in Kigali due to the lack of family and community support. They do not know what is going to happen in businesses, particular in Kigali where there is stiff competition. Therefore, the fear of failure dominates the success (The New Times, 2017; Mbabazi, 2018). The report of Global Entrepreneurship Monitor (GEM) on women entrepreneurs measured the fear of failure among its countries members. The results indicated that the level of fear of failure in Sub-Sahara Africa is higher compared to other continents, due to the patriarchal and influential culture in Africa. Women showed a high fear of failure more than men in all businesses. But the majority of women own micro-enterprises (Kelley et al., 2011).

They experience high levels of stress and male entrepreneurs in Kigali refuse to integrate them in business. These men maintain patriarchal views and they attribute women fear of failure to lack of entrepreneurship skills. However, the reality is that women are smart in running a business; they treat consumers better compared to men. Men fear sharing the market and information with female entrepreneurs and are afraid that consumers may shift from men to women entrepreneurs (Mbabazi, 2018). The following section describes the skills challenges that women entrepreneurs face.

2.8.5 Skills constraints challenging women-owned SMEs in Kigali

The preceding section explained the fear experienced by women-owned SMEs in Kigali. This section emphasises the skills constraints faced by women-owned SMEs in Kigali. These constraints are lack entrepreneurship skills, lack of training and education, and lack of ICT skills.

2.8.5.1 Lack of entrepreneurship skills, training, education, and experience

This section covers aspects regarding skills, training, and education constraints experienced by women-owned SMEs in Kigali. These include lack of entrepreneurship skills; management skills, and business experience. Over many years, the Rwandan female was disadvantaged in education and it took nine years girls after boys to attend primary school; 26 years after boys to enrol in secondary school. Rwanda National University was launched in 1963, opened only to boys (Rwanda. Office of the president of the Republic, 1999; Byanafashe, 2006; Fellman, 2012). Despite the government's

effort to promote equal education among Rwandan females and males, women still lag behind men in many fields of education, including entrepreneurship, business management, engineering and the sciences. This harms women businesses in Kigali. This constraint restricts them from running businesses in sophisticated industries like ICT that requires skills in the domain; rather, they run convenience businesses which do not require specific skills.

Unites States of America. USAID (2009) observed that the deficient background of Rwandan females in education, continues to manifest its negative effect on females affecting their businesses activities. Many women-owned businesses in Kigali lack entrepreneurship skills that affect their businesses growth management process and competitiveness. The finance management shortage skills among women-owned SMEs in Kigali challenge them to decide on how to use cash inflow and outflow, which affect business growth (Mbabazi, 2015). However, training and education are known as a strong weapon to improve efficiency, effectiveness, ability to identify new opportunities, creativity, and innovation which drive a sustainable business. Training and education should be relevant to meet the current business environment needs to ensure business performance and growth (Byumvuhore, 2018).

Interestingly, an evaluation study conducted with United States of America. USAID (2009) looked at the impact of training on business and revealed that some men and women-owned businesses in Kigali who trained in entrepreneurship and business management, post-training evaluation indicated that their businesses performed better than those of women and men not trained. Comparing women and men entrepreneurs trained together, women businesses were progressing better than those of their male counterparts.

Therefore, given the same opportunities, women may change the business landscape and share the market with men, perhaps, women may take advantage and outperform men. Involving women entrepreneurs in mainstream entrepreneurship training and education may increase wealth distribution, taxes revenues, gender parity, and GDP, while decreasing the entrepreneurship gender gap and gender inequality. They can grow their SMEs to high levels rather than continue running small-sized enterprises.

Chinomona and Maziriri (2015) of South Africa argued that a sustainable women business could be achieved when the female enrols in higher education, particularly in science and engineering which are a catalyst of creativity and innovation. Ndisanze (2017) agreed with Chinomona and Maziriri (2015) but, he took a holistic approach in observing the business environment trend and its change. He believed that women-owned SMEs in Kigali and other developing economies should embrace all fields of tertiary education and ICT. Education should be supported by ongoing training to manage change in business. The macro-economy can distress entrepreneurs, however those that are trained and educated will persist, adjust and move forward.

2.8.5.2 Lack of Information and communication technology skills constraint

ICT has become a daily part of the life of people in developed and developing economies. It is integrated into various fields, including the social and business environment. In the business arena, ICT is a competitive weapon due to its power to quickly access information and transmit it within a short period to many people. However, in developed and developing economies, women are less connected to ICT compared to their male counterparts and this creates a gender digital divide (Suresh, 2011; Badran, 2014).

The digital divide is any inequality in ICT (German. Federal Minister for Economic Cooperation and Development, 2013). International Communication Unions (ITU) reported that 50.9% of men use the Internet compared to 44.9% of women worldwide (ITU, 2016). This is not different from what happens in Rwandan telecommunication, where men embrace ICT more than women.

Figure 2.7 indicates the distribution of access to ICT compared to men and women. Men dominate women in cellphone use with 68% versus 50.9%; computer, 2.8% men versus 1.7% women. However, women own more radio, 66.1% versus men, and 41.1%. Moreover, 11.2% of men have access to the television versus 6.1% women (Rwanda. NISR, 2016). Men dominate in ICT tools except radio because the society attributes all advantages to men. It is not surprising for women to have more radio (66.1%) than men (41.1%) as many women stay home in isolation doing housekeeping activities; they listen to the radio as a source of information.

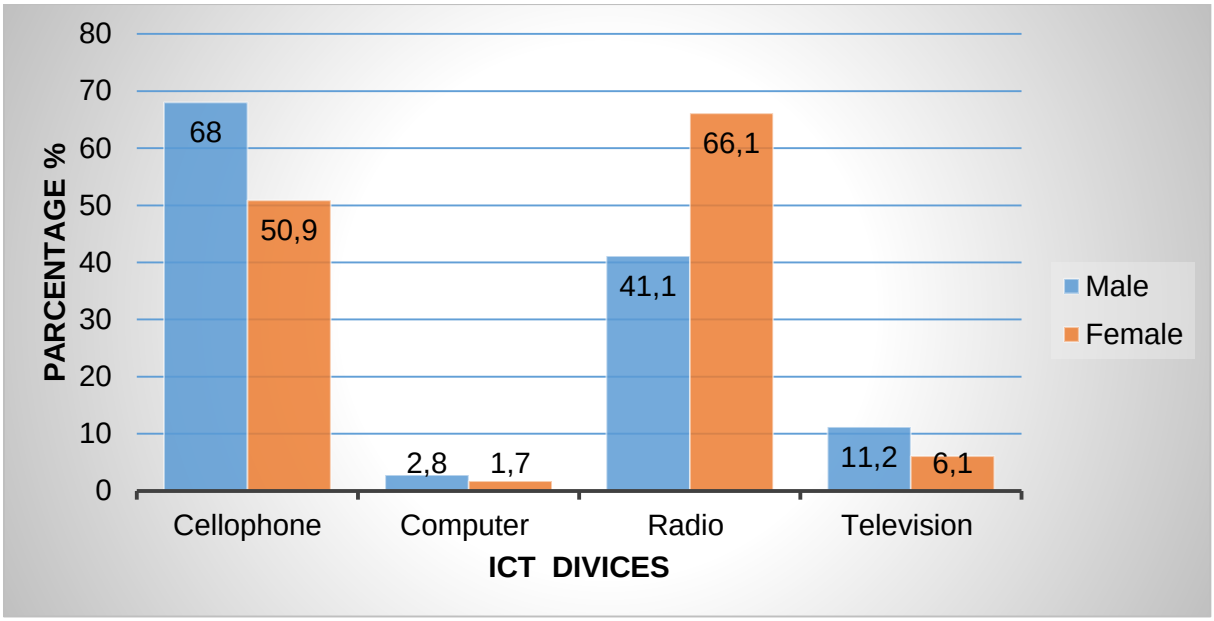

Figure 2.7: Percentage of households possessing ICT assets by sex of household head Adapted from Rwanda. National Institute of Statistics of Rwanda (2016:120)

Many women-owned SMEs in Kigali lack ICT skills. Although they have computers, cellphones and Internet, their ability to use these are limited. Using ICT requires skills and foreign languages such as English and French. Many Rwandan women are at a disadvantage as they may not know the languages programmed in ICT devices due to the background of girls formal education in the country (Ngoboka, 2013).

Lack of ICT skills limits women entrepreneurs in Kigali and keeps them running traditional businesses which are less competitive. The time has come for them to synergise traditional business with digital business to be more productive, competitive and benefit ICT incentives. It is essential to empower women with ICT skills to effectively compete in a business environment. This will ensure the sustainability of women businesses in Kigali, moving them from micro-enterprises to small, medium, and large businesses. At the same time, ICT skills can contribute to decreasing the gender digital divide and entrepreneurship gap (Bishumba, 2017). Unfortunately, constraints disadvantage women in their entrepreneurship activities in Kigali. The constraints discussed above remain challenging to the growth of women-owned businesses in Kigali; as a result, they usually have small enterprises when compared to men. Thus, the second hypothesis is identified and cited.

H_2: There is a negative relationship between the constraints faced by women-owned businesses in Kigali, Rwanda and the management of small-sized enterprises.

The following section explores how ICT could intervene in solution-solving of constraints experienced by women-owned SMEs in Kigali.

2.9 Integration of ICT in women's SMEs in Kigali, Rwanda to overcome potential constraints

The previous section discussed the potential constraints experienced by women entrepreneurs in running small and medium businesses in Kigali, Rwanda. This section answers the third research question "How could information and communication technology intervene to find solutions to constraints facing women entrepreneurs in doing business in Kigali, Rwanda"? The objective of this question is to explore how information and communication technology could intervene to find the solution to constraints facing women entrepreneurs in doing small and medium business. The third research question answers the second research question. It indicates how women-owned SMEs in Kigali can leverage ICT tools (cellphone, Internet, PC, tablet) to mitigate and solve their constraints in running their businesses.

This section explores how ICT can contribute to solving probable constraints experienced by women-owned SMEs in Kigali. As discussed in the previous section, these constraints are categorised in five groups: gender inequality, finance, government, own fear, and skills. The following section discusses the benefit of the Internet to women businesses.

2.9.1 Importance of Internet to women-owned SMEs

The role of the Internet is significant in various domains of society. For instance, it is a powerful tool for education as it facilitates the teaching and learning process. The Internet has considerably changed the medical field as doctors can interact with their colleagues and patients far away. The Internet brought more change and innovation in entrepreneurship, and it creates jobs. Building womens' capacity in Internet use opens a new opportunity for workplace and entrepreneurship (Marzocchi & Bonewit, 2015).

However, incorrect utilisation of the Internet leads to unlawful activities. Criminals take advantage to plan, organise and commit crime through ICT which exacerbates human

trafficking of women, children, drug trafficking, kidnapping, fraud, robbery, and so on (Marzocchi & Bonewit, 2015). The Internet is an essential business tool that drives women entrepreneurs in the global market. Women sell and advertise their products and services online and through the media. Before the birth of the Internet, big companies monopolised the global market. Nevertheless, the Internet created room for women-owned SMEs. The Internet creates a large number of consumers and it influences supply chain management (UNCTAD, 2014).

The researcher believes that integration and use of ICT into women SMEs can play multiples roles including mitigating or contributing to finding a solution to constraints experienced by women-owned SMEs in Kigali. ICT can improve performance, the competitiveness that leads to business growth and sustainability (see Table 2.6 and Figure 2.8). Table 2.6 explains Figure 2.8. Figure 2.8 is a conceptual framework of integration of ICT in SMEs.

Table 2.6 indicates the numerical interrelations of the conceptual framework of the integration of ICT in SMEs. It also includes the barriers like cybercrime that could be experienced in the process of integration of ICT. The framework starts on number one by introducing the integration of ICT into SMEs and continues with constraints as detailed in Table 2.6.

Table 2.6 Conceptual framework of integration of ICT in Small and Medium Business

1	Integration of ICT in SMEs: SMEs facing constraints to adopt ICT to help overcome constraints
2	ICT action on SMEs constraints leads to a change in SMEs
3	Entrepreneur-owned SMEs and employees accept change, but they do not have skills in ICT. They go through ICT training.
4	ICT empowers entrepreneurs and employees with ICT skills that they apply in SMEs to acquire success change
5	The change went well in business and achieved results in terms of effectiveness, efficiency, and competitiveness.
6	The result leads to SMEs performance
7	Integration of ICT in SMEs continues to support SMEs performance.
8	SMEs performance leads to SMEs growth in market share, income and employees.
9	Integration of ICT in SMEs continue to support SMEs growth.
10	Cybercrime: cybercriminals observe a growing number of SMEs and decide to attack it
11	Cybercriminals attack SMEs in its ICT system to steal or disrupt through malicious software or viruses.
12	SMEs' ICT system detects cybercriminals and calls its security system to fight the cybercrime to protect SMEs.
13	ICT security system attacks cybercriminals to defeat cybercrime
14	ICT security system battle annihilate cybercrime thus Cybercrime failure
15	Cybercrime failure so SMEs protected
16	An ICT security system protects SMEs
17	SMEs protected and continues the growing process
18	SMEs reach the maturity and sustainability

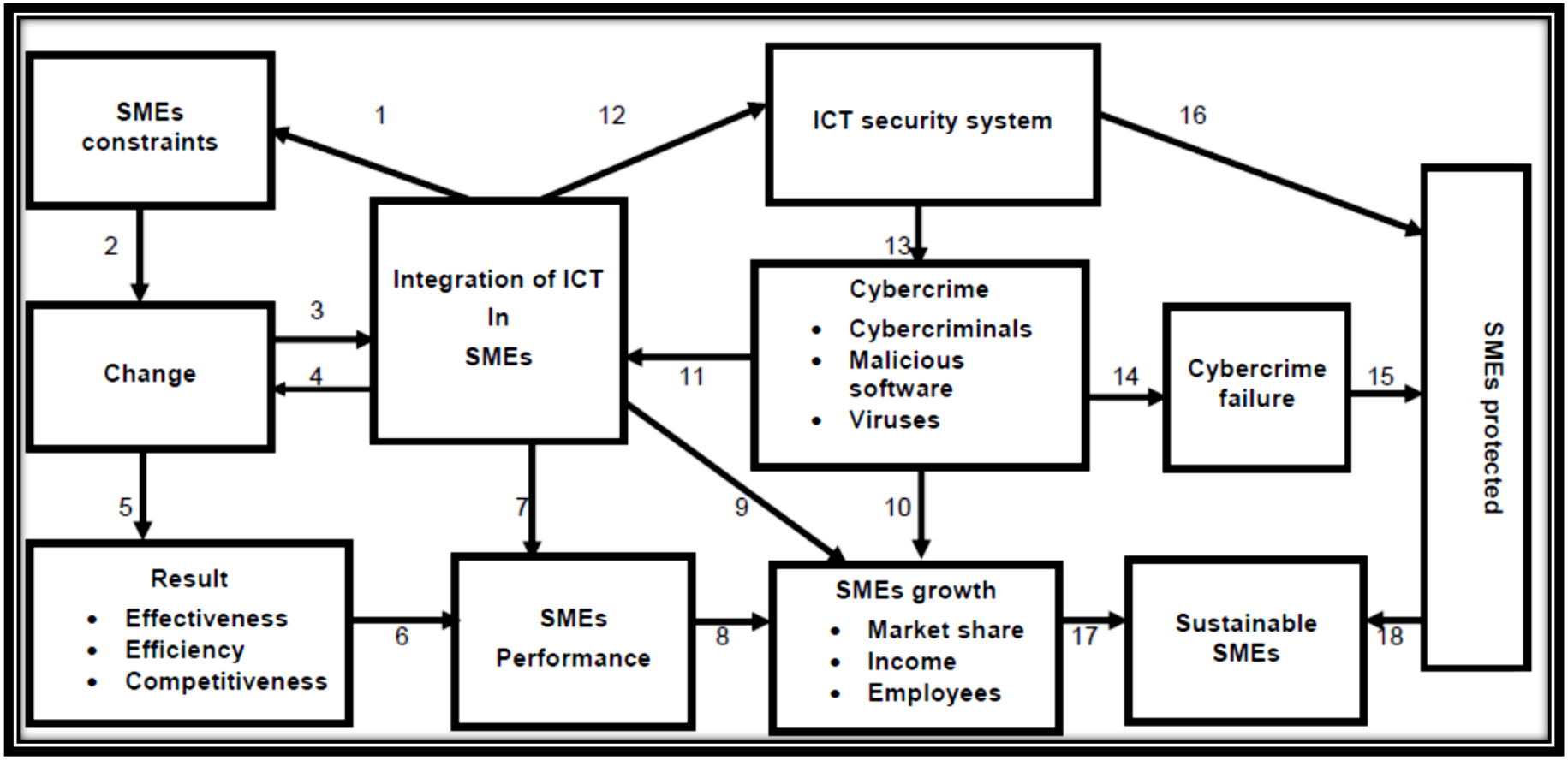

Figure 2.8: Conceptual framework of integration of ICT in Small and Medium Business (Researcher, 2020)

The importance of ICT is broad; this study focuses on the Internet and cellphone and how women-owned business in Kigali can use it to find a solution to the constraints they face during running businesses in Kigali. The probable constraints were mentioned above in five groups: gender inequality; finance; government; own fear; and skills respectively. The literature review shows the intervention of ICT in each of these groups. The next section focusses on how ICT can be used to promote women businesses and find solutions to gender inequality in business.

2.9.2 Online information to mitigate, reduce the severity and find solutions of gender inequality

This section indicates how ICT can be used as a solution, part-solution or prevention of possible constraints related to gender facing women-owned SMEs in Kigali. These constraints are gender disparity, cultural norms, and inadequate access to finance, physical mobility, and family responsibility. These are discussed below.

2.9.3 Online information to overcome gender parity in business constraint

Over many years, organisations like the UN, civil society and governments have promoted gender equality advocating for men and women to have the same rights and opportunities. Despite this effort, gender equality in developed and developing economies has not been achieved. The Internet has the power to change the gender inequality status quo constraining women in entrepreneurship and promote gender equality in entrepreneurship and other fields (UN, 2016).

Ommundsen and Kteily (2018) stated that ICT has changed the business environment in Arabic economies of the Middle East dramatically where patriarchy, culture and religion discriminate females in entrepreneurship. They integrated ICT in their businesses, and it has opened opportunities for them. Interestingly, one-third of start-ups SMEs belong to women. Women entrepreneurs in Kigali should leverage best practice from Arabic women entrepreneurs.

Ommundsen and Kteily (2018) observed that the Internet opened a window of opportunity to women. They can open businesses online to sell their products and services to an unlimited market. The Internet offers opportunities to women

entrepreneurs to run a business from home. Sweet (2016) acknowledges the critical role media plays in promoting women businesses and gender parity. Furthermore, an increase of digital fluency will accelerate their SMEs growth, access to large markets, opportunities to a high position, and gender parity. In Rwanda and many developing countries, gender inequality is strengthened by a culture where men benefit more than women. The next section looks at how ICT can overcome cultural constraints facing women-owned SMEs in Kigali.

2.9.4 Internet challenges cultural norms constraint

Culture disadvantages women in Rwanda due to a patriarchal and stereotypical society. However, according to Mlambo-Ngcuka (2018), the Internet can break down the cultural norms that discriminate women from entrepreneurship and open up opportunities to women entrepreneurship. ICT creates a platform to address masculinity and feminist parity through media. The Internet and cellphone may be used to address the message of tolerance and equality among men and women. Therefore, culture should not be a constraint for women to run a business and women-owned SMEs in Kigali need to share their views on culture constraints and raise their voices on inequality. This can be done by perhaps signing petitions to address how the cultural norms affect their business activities.

Alton (2019) argues that ICT challenges culture actively, it propels women entrepreneurs to reach local and international markets which would otherwise be hampered by cultural norms. ICT encourages women entrepreneurs to think out of the box, to open online businesses which they can run while staying home.

Sweet (2016) concludes that ICT opens opportunities to women entrepreneurs in fields that would not be available before. ICT can therefore contribute to driving women to start and run successful businesses. However, ICT should not be used to destroy the value of society, rather improve it for the benefit of all. The next section investigates how ICT can intervene in accessing the finance.

2.9.5 Online information to solve access to capital constraint

In many economies women suffer from obtaining funds to open or grow their enterprises, Rwanda is no different. However, the Internet can help women-owned SMEs in Kigali to defeat inadequate access to the capital constraint. They can use the Internet to search for information regarding funds. The Internet search engine provides information regarding how women can access finance and how to approach government and stakeholders in seeking financial support (Martinez & Nguyen, 2014). Asian Development Bank (ADB) observed the funds targeted for women-owned SMEs, but women do not know about these products due to lack of information. Using the Internet, they may access information that indicates where to access and apply for funding. Perhaps, they can apply for a loan and follow up online (ADB, 2012). Furthermore, women-owned SMEs in Kigali can pay their expenses and receive money via mobile money. It is quick, costs less and minimises theft (UNCTAD, 2014). The next section provides ICT solutions toward physical mobility constraints.

2.9.6 ICT solution to physical mobility constraint

Women entrepreneurs in developed and developing economies rely more on public transport in doing business. However, they are not safe as they often face sexual harassment. Women using public transport is a problematic issue that needs quick intervention. WB proposed the integration of ICT to prevent women sexual harassment in public transport. In this way women can report abuse at any time. This implementation was successful in Mexico by creating an application that works with a cellphone (WB, 2016).

OECD (2018) reports that women-owned businesses experienced many years of mobility constraints relating to how to supply and improve their businesses. The Internet brought a solution for them; they can attend conferences via the Internet, interact with networks, negotiate markets, order and pay stock, attend training, among others without mobility. They can concentrate on their business while taking advantage of ICT. In this regard, cellphone and Internet are useful and combining the Internet and cellphone in doing business can improve service quality, efficiency and effectiveness. If women-owned SMEs in Kigali integrate ICT in their daily activities it may add value to their business and anticipate any kind of abuse during travelling. Usage of mobile

phones and the Internet is vital in saving money, time, focusing on the business and eradicating sexual harassment. The following section describes how ICT can be used to solve family constraints experienced by women-owned SMEs in Kigali.

2.9.7 Contribution of ICT to solve family responsibility constraint

Starting and growing a business requires energy and enough time to concentrate on the business. Women work hard to make their SMEs succeed and at the same time, take care of household responsibilities. ICT can be leveraged to create time for family and themselves by opening an online business (OECD, 2018). ICT provides a virtual office option where a person can work anytime and anywhere. This can be done using a PC, tablet, and smartphone connected to the Internet that can save considerable time for her family. Furthermore, making her cellphone number available to customers means that they can contact her to find out where she is, her business hours or which range of products she offers and possible order products (Martinez & Nguyen, 2014**;** UN, 2014). Women-owned SMEs in Kigali may also be able to effect transactions, for instance, paying, receiving money through mobile money or an electronic payment which limits physical mobility, while increasing their safety through online money transfer (Alton, 2019). OECD (2018) observed that the Internet created more time for women to spend with their families. The time spent travelling for businesses activities were significantly reduced with the integration of the Internet and cellphone into their businesses. The following section discusses the role ICT can play to mitigate and fight against sexual harassment.

2.9.8 Internet solution to sexual harassment constraint

During the last two decades, telecommunication technology has developed enormously. The popularity usage of ICT devices, for instance, the cellphone, tablet and PC had a positive impact on sexual harassment in business. Sexual harassment attempts by public, private, and NGO officials have been recorded through a cellphone and these officials have been prosecuted. However, some countries like the USA consider unconsented recording as a crime (Boice, 2018). But, in case of sexual harassment and discrimination, the USA court validated the unconsented recording (GovDocs, 2014).

To avoid sexual harassment, the Rwandan government automated services including RRA where all taxes could be paid on a website - Irembo, and the application for public tender and procurement could be done through the RPA website Umucyo (Camargo & Gatwa, 2018). Behind this, the anonymous free of charge cellphone (+250)778 843 2516 and email rwanyaruswa@ombudsman.gov.rw was opened for the public to report corruption and sexual harassment (Rwanda. Office of Ombudsman, 2019). The following section underlines the Internet's role in solving finance constraints.

2.9.9 Internet resolution to cope with finance constraints

This section discusses how the Internet can be used to contribute to lack of collateral and high-interest rate facing women-owned SMEs in Kigali.

2.9.10 Online information to solve lack of collateral constraint

Internet search engines have been identified as a powerful tool to provide relevant information that can find a solution of collateral facing women-owned SMEs in Kigali. Collateral is one of the constraints which hamper women-owned SMEs in Kigali to access finance. However, the literature indicates that there are many initiatives created to help women-owned SMEs in Kigali to grow their ventures, for instance Cooperative Duterimbere (COOPEDU). But, they are less informed about those products. The Internet can help women-owned SMEs in Kigali to find information regarding women funds and initiatives which can help them to realise their entrepreneurship ambitions and access finance without collateral. For example, a cellphone can use media like Facebook, WhatsApp and Twitter, among others to share information in this regard (COOPEDU, 2012; Rwanda CARE, 2016; The New Times, 2017; Alibhai et al., 2019). Reputable financial institutions like WB deplores how the commercial banks and micro-finance lend based on collateral criteria which are often fixed assets that deprive many entrepreneurs, particularly women who do not have fixed assets to obtain loans to start and grow their businesses. This impacts on those banks because they hold money that is not circulated to generate profit for them. The WB innovated psychometrics credit assessment methods to screen the honesty of borrower to determine whether they can pay back the money. This innovation should be integrated into collateral. The method consists of a computerised group of questions borrowers answer and the computer processes the results showing whether the person is trusted to pay back the loan.

Surprisingly, psychometrics credit assessment method was successful in Ethiopia and Peru (Bruhn, et al., 2016; Gaye, 2018; Alibhai et al., 2019). Some women entrepreneurs received credit and reimbursed the money before the due date. Women entrepreneurs who repaid duly should have access to other credit without asking them about collateral (Bruhn et al., 2016). To overcome collateral constraint among women-owned SMEs in Kigali, they should use the Internet to find out how psychometric credit assessment works. They could ask for support from stakeholders to convince financial institutions to consider psychometric credit assessment as collateral for those who lack collateral to access loans. It was successful in Ethiopia and Peru. Women-owned SMEs in Kigali can use the Internet to search for information about psychometrics credit assessment and how it works. They can raise their voices to financial institutions to integrate psychometrics credit assessment among collateral. Thus, those who do not have collateral can be evaluated through psychometrics credit assessment to access if they are suitable to get loans (The New Times, 2017; Alibhai et al., 2019). The next section indicates how women-owned SMEs in Kigali can leverage the Internet to find solutions to high-interest rates.

2.9.11 Leveraging the Internet to challenge high-interest rate constraint

High-interest rate challenges the start-phase and growth of the business life cycle. The loan offered is often short-term and puts pressure on business owners to pay back the money (WB, 2009). The average of Rwanda's interest rate is 18%, South Africa is 10% (Bracher, 2019; WB, 2019). Women-owned SMEs in Kigali can use the Internet to search for a reliable financial institution which can provide a lower interest rate. Johnson (2019) reports that women-owned SMEs should look around for loans without interest, for example, women grants and associations dedicated to improving women-owned business by providing loans without interest and loans with interest should be the second option.

Women-owned SMEs should study the terms and conditions of the loan carefully before making a final decision. Women-owned SMEs in Kigali may use the Internet to search information online regarding interest rates, learn the benefit of every single offer and compare them with the present information online so they can make a right decision on the interest rate. The Internet also has a say on the constraints related to government confronting women-owned SMEs in Kigali. The next section indicates the

role ICT can play in contributing to solution-solving government constraints facing women-owned SMEs in Kigali.

2.9.12 The role of ICT to harmonise government services

Women-owned SMEs in Kigali also complain about the government constraints in their business. Some of these constraints are direct from government or indirect from its officials and stakeholders. These constraints include access to government services, high tax rates, corruption from government officials, the high cost of telecommunication, high transport cost, and inadequate access to networks, business competition, and lack of market. ICT intervenes in a different way to find a solution to those constraints as discussed below.

2.9.13 Internet tool to resolve access to government services constraint

The government of Rwanda promotes the usage of ICT in their departments and encourages the private sector to do so. All information regarding businesses are online; it is a matter of accessing the Internet to search for information needed. For instance, investors who are interested in doing business in Rwanda can register online. This saves time and cost (WB, 2019). Ben-Ari (2014) reported that the Rwandan government promotes the usage of ICT in accessing government services. SMEs can register at the Rwanda Revenue Authority (RRA), and pay taxes without meeting a government official and applications for public tender can also be found online at Umucyo (Camargo & Gatwa, 2018). The next section discusses the intervention of ICT in high tax rates.

2.9.14 Online information to resolve high tax rates constraint

Information and communication technology introduced SMEs to software which can help women-owned SMEs in Kigali to overcome high tax constraints. According to economists, taxes, whether small or significant decreases business investment and at the same time increases government revenues (Ross, 2018). Writer (2018) argues that having a better understanding of how tax works in the USA; tax incentives provided to entrepreneurs; the taxable or not taxable regimes while doing business, will equip women-owned businesses in possibly resolving their high tax issues. Gunderson

(2015) conducted a longitudinal study for 12 years, and the findings revealed that more than 93% of SMEs in the USA paid more taxes than what they should pay. Daisyme (2018) concludes that no one is good in taxation. However, going online using software like TaxSlayer, TurboTax and H&R Block to pay taxes can provide assurity as the taxes will be well calculated.

Roberts (2019) argues that many SMEs in developed and developing economies get penalised due to mistakes made during taxes counts (calculation). However, these mistakes should be avoided if entrepreneurs used software to do the job. On the other hand, entrepreneurs paid more than what was expected. Despite the refunds, this money should be reinvested into the business to generate profit. Women-owned business in Kigali should use online software to calculate correct taxes and save time. They do not need an accountant; as this can be done via the Internet. The Internet can also be used to mitigate or fight corruption among government officials as will be discussed below.

2.9.15 Internet can fight against corruption among government official

Corruption has been reported as a probable constraint facing women-owned SMEs in Kigali (Transparency Rwanda, 2011 TI, 2018). Ear-Dupuy and Serrat (2017) argued that corruption affects everyone, but women-owned SMEs are vulnerable, they need to access public services free of corruption. Sousa (2018) reported that the integration of ICT in public and private sector services facilitate the implementation of their plans, improve awareness and accountability, and strongly fight against corruption. Ben-Ari (2014) stated that the Rwandan government digitalised many services to provide excellent services to clients, while anticipating and fighting corruption. Women-owned SMEs in Kigali register their business and pay taxes online without visiting the RRA office. Camargo and Gatwa (2018) reported that the creation of the website Irembo and implementation the RRA rules stipulate that all taxpayers must pay taxes via Irembo. This was successful in improving tax services; confidence, and transparency. The online system replaced the old paper system where the taxpayer had to visit the RRA office and work on her tax with a government official, which provoked bribery.
Furthermore, when using the Internet amounts paid are exact and this reduces possibility of corruption. The Rwanda Procurement Authority (RPA) application is done online through the website Umucyo for transparency. In Rwanda, Office of the

Ombudsman uses the Internet and cellphone among other techniques to fight against corruption. The Ombudsman provides the public with an email address rwanyaruswa@ombudsman.gov.rw and cellphone number (+250) 778 843 2516) to anonymously report any form of corruption. (Rwanda. Office of Ombudsman, 2019). The next section explains how ICT can be used to reduce telecommunication cost.

2.9.16 Internet solution to the high cost of telecommunication constraint

Women-owned SMEs in Kigali complain about costly telecommunication. However, there are ways entrepreneurs can minimise cellphone call expenses to 45% while communicating with networks. Voiproutes (2016) proposes the usage of Voice over Internet Protocol (VoIP) to cut cellphone expenses. It uses the Internet to make calls and calls are not limited to the country; they can be national or international. These including Imo, Skype, Viber, and, WhatsApp, among others. Integration of VoIP into women-owned SMEs in Kigali could help save money and grow their businesses.

Brown (2016) advises SMEs to search the best practice to communicate inside and outside the organisation. In his experience, SMEs communicates via Skype and Wifi enjoy savings. Central (2018) proposed entrepreneurs to search cheap VoIP application on their phone and download, for instance, Skype, Viber and WhatsApp. The author recommends making cellphone calls when it is necessary. Otherwise, emails would be useful and cheap. Women-owned SMEs in Kigali may choose a cheap way to communicate to save money to grow their business. The following section describes how the Internet can intervene in transportation to pay a low price.

2.9.17 Online information to solve high transport cost constraint

Traditional entrepreneurs travelled to buy stock, but with access to the Internet, women entrepreneurs can make an order and pay online or using mobile money. This can save money, time, and avoid the danger associated with travelling. Pienaar and Vogt (2012) specialists in business logistics management, report that the Internet improved the transport industry by cutting transport cost through its power to connect supplier, buyer, and freight brokers at the same time. Entrepreneurs are no longer worried about transport; it is a matter of ordering through email, paying electronically or through mobile money, while requesting an available freight broker to deliver goods to a

destination. For instance, on-road transport cost becomes affordable even cheap by combining goods from different entrepreneurs in one truck; entrepreneurs pay according to their bulk. This means that those SMEs that ordered a small number of goods will pay a small amount of money. Women-owned businesses in Kigali can reduce cost of transport by attending training and conferences online or using the Internet or video-conferencing instead of travelling (Martinez & Nguyen, 2014). The next section highlights how ICT may assist women-owned SMEs in Kigali in accessing networks.

2.9.18 ICT as access to networking constraint

The culture in many developed and developing countries limits women movements to network for business. Women-owned SMEs suffer more from culture restriction mobility to visit suppliers to negotiate business deals. Consequently, they buy high price inventory from distributors and warehouses, which engenders small profit. Men on the other hand obtain products from supplies at a lower price. However, ICT can facilitate successful networking communication via the Internet, the cellphone among other communications channels, discussing business, delivering goods and payments for instance online or through mobile money without mobility (Bishumba, 2017; Mbabazi, 2019).

Many people use the Internet to search for the information they need in the domain of their interest. Women-owned SMEs also take advantage of this search engine to navigate and find the networks and information which can help them realise their entrepreneurship dreams. For instance, a vibrant Rwandan young female entrepreneur found an opportunity in the water supply business, although she did not have any skills in the industry. The Internet connected her to the right networks; reliable information, and skills to complete the project. As a result, the community is enjoying the potable water from her project (PanorActu, 2018).

Interestingly, vibrant women entrepreneur Ms Yvette Ishimwe integrated successful ICT in her enterprise. As a result, ICT advertised her water supply project achievement and its impact on the community. Queen Elizabeth of the United Kingdom rewarded her for changing the lives of many people (PanorActu, 2018).

Nefesh-Clarke (2017) and Kiran (2018) argue that ICT has a high capacity; it challenges discriminatory culture and gender inequality. It provides women-owned, SMEs freedom to interact with extensive networks. However, some conservative men view ICT as culturally destructive because it liberates women entrepreneurs and provides them with the freedom to interact with networks. Fortunately, the Internet, email, cellphone, among other communication tools, can be used to communicate with any network, anywhere. Many suppliers are enjoying working with these women entrepreneurs who are considered as a new economic force. The Internet and cellphone considerably changed women-owned businesses in Kigali by alleviating barriers which hampered access to key stakeholders. The next section discusses how ICT can create awareness in business competition.

2.9.19 Information and communication technology strengthens SMEs competition

The successful growth of SMEs is linked to its competitive advantage. Women-owned SMEs in Kigali face competition constraint on the local and international market. However, effective integration of ICT can position SMEs to becoming successful. Goswami and Dutta (2015) observed that competitive advantage and business success rely on how an organisation adopts ICT in business. Businesses with good ICT challenges competitors and can become a leader in their field.

ICT creates value and opportunities for SMEs while fighting rivals' pressures. It helps SMEs to create cost leadership; lower price of products by the economy of scale. ICT accelerates supply chain, and communication with networks (Pienaar & Vogt, 2012) Integration of ICT in women's SMEs in Kigali may help them compete and share the market with local and international competitors that will grow to achieve sustainability. Selling online increases competition and consumers can see your products, but they may not know how significant the business is. The Internet facilitates traffic of goods and service at an affordable cost (German. German Federal Minister for Economic Cooperation and Development, 2013). German. German Federal Minister for Economic Cooperation and Development (2013) states that businesses benefit from the Internet. However, SMEs benefit the most, they receive information on the public and private tenders, and they compete with large companies. Camargo and Gatwa (2018) argued that the window of opportunity in the Rwandan public tender and

Procurement has opened for women entrepreneurs in Kigali. They have to visit the Umucyo website for tender applications. Women-owned SMEs in Kigali might take advantage and compete with large businesses. However, while they try to embrace ICT, lack of market is another challenge.

2.9.20 ICT helps SMEs to extend market

The Internet is known as a robust search engine to identify new markets. It has rescued many businesses in distress. It offers many market opportunities to entrepreneurs, particularly women who still confront cultural norms, stereotypical behaviour, and gender inequality in entrepreneurship. Women-owned SMEs in Kigali face competition constraint, and they have a challenge in targeting new and niche market locally and internationally and expanding their businesses. As discussed above in constraints facing women-owned SMEs in Kigali, handcrafting, clothes, and shoes among others complain of lack of market to sell their products, which limit their production capacity (USAID, 2009; Muhayimana & Kimemia, 2015).

However, ICT is a sustainable solution for women-owned SMEs in handcrafting, clothes, shoes, and other industries by opening an online shop (e-commerce). ICT advertises their products online, radio, television, social media, and utilise the Internet of things to look for new customers. The Internet and cellphone applications are an appropriate tool woman can use to reach the information to help find new markets to sell their products and services. E-commerce shows power to extend the market and facilitates buyers to purchase products online elsewhere in the world, including those made in Rwanda (Badran, 2014). Totka (2019) advises that women-owned SMEs in Kigali can extend their market share by asking satisfied consumers to publish online/media affirmative information and positive experiences on the products or services bought from them. This may lead to other consumers being interested in purchasing the products or services. Section 2.9.21 focuses on the role the Internet can play to assist women-owned SMEs in Kigali overcome fears that impede their growth.

2.9.21 Intervention in the resolution of ICT to own fear constraint

This section focuses on two fear constraints facing women-owned SMEs - HIV/AIDS and fear of failure. These are discussed below.

2.9.22 Internet role in releasing HIV/AIDS constraint

The Internet enables the provision of more health information through communication devices, for instance, through smartphones. The United Nations Education, Scientific and Cultural Organisation (UNESCO) believes that the global target to eradicate HIV/AIDS by 2030 can only be achieved by full integration of ICT in the health system (UNESCO, 2018).

Svoronos et al. (2008) stated that the Ministry of Health in Rwanda connects to TRACnet application using cellphone SMS to track HIV/AIDS, Tuberculosis, and malaria among the Rwandan population. It helps to ensure that everyone obtains the necessary services on-time. Rwanda. Biomedical Center (2018) reports that any HIV positive person receives medication immediately, free of charge. The patient can contact the hospital regarding their health via cellphone and email, among other communications tools; there is no need to walk to the hospital.

Ministry of Health acknowledges the incredible ICT power to combat HIV/AIDS and other epidemics. They value the Internet and cellphone among the critical public health education tools and the unlimited capacity of the Internet to express health communication all over the world. This ministry posts all public information online on HIV/AIDS prevention, testing, treatment, counselling, and fighting against stigmatisation that isolated people living with HIV/AIDS (Rwanda. Ministry of Health, 2018). Thus, women-owned businesses in Kigali who live with HIV/AIDS have the opportunity to use a cellphone, Internet, or other communication channels to interact with their doctors and social workers. They can also check the Internet for information on how they can keep healthy and manage stigmatisation while running their businesses. The next section demonstrates how ICT can be used to overcome fear constraints to productively and successfully manage their businesses.

2.9.23 Online information helps to overcome the fear of failure constraint

Fear of failure varies from person to person. This fear may be high in women due to lack of community support to launch or run a business. However, the Internet may help to eliminate the fear of failure constraint to women-owned SMEs in Kigali and prospective entrepreneurs. There are dedicated successful women entrepreneurs who provide mentoring and coaching to future women entrepreneurs, start-ups and those in the growing phase, online. There are also online groups and social media which share business skills and experience. Joining these groups can provide leverage, decrease the stress of failure, and encourage women entrepreneurs to run a successful venture (Harris, 2018). The next section highlights how women-owned SMEs in Kigali can learn online.

2.9.24 E-learning as a sustainable solution to skills constraints

The previous section concentrated on the intervention of ICT to overcome their fear among women-owned SMEs in Kigali. This section emphasises E-learning as a robust technology tool to empower women with skills in entrepreneurship and ICT skills to run modern enterprises.

2.9.25 Acquiring entrepreneurship skills through ICT

For many years, Rwandan females were given little or no opportunity for schooling. Males were targeted for education. Consequently, many women opened and ran a business without entrepreneurship skills. However, women can learn computer literacy on the Internet (UN, 2014).

Traditional teaching-learning used paperwork; students received books and teachers gave a lesson in class. The Internet changed teaching-learning as it can be done online. The Internet can offer training and education to strengthen entrepreneurship and other domains. Women-owned SMEs in Kigali who were disadvantaged to obtain formal education may learn the online skill to improve the efficiency and effectiveness of their enterprises (German. Federal Minister for Economic Cooperation and Development, 2013). The next section discusses how ICT can enhance skills of women-owned SMEs in Kigali and other developing countries.

2.9.26 Leverage ICT to solve lack of ICT skill constraint

The development of technology imposes a change in many fields and entrepreneurship is no exception. Galbraith (2018) takes a holistic approach to explain the importance of ICT skills in SMEs performance. ICT, as an innovation catalyst keeps entrepreneurs aware of what happens around them in the business world. The success introduction of innovation into businesses makes it competitive. Business without ICT stays behind with little chance to survive. Many consumers particularly youth enjoy engaging in social media to approach suppliers. The Internet and email become common in administration, social, and business. Lack of ICT skills isolates entrepreneurs. Thus, without embracing ICT, there is no predictable future for their businesses. OECD (2002) proposes a methodology to acquire ICT literacy skills for women-owned SMEs. This can happen when women entrepreneurs equipped with ICT knowledge train their colleagues in successfully running women-owned SMEs. The training should be successful due to the trainers being in the business industry like them; they know what ICT skills they need to run a smart business and can respond positively to the business and stakeholders demands.

Hoxha and Capelleras (2010) and Werber, et al. (2015) argued that empowering women-owned SMEs with computer literacy, Internet, cellphone applications and some analytic data software may improve their skills to perform better in business; grow and increase revenues. They can also leverage ICT to overcome other contraints facing business and society. From Hoxha and Capelleras (2010) and Werber, et al.'s (2015) perspective, women-owned SMEs in Kigali trained in ICT would not worry about competition and would embrace ICT to improve the functioning of their businesses.

Ndagijimana et al. (2018) agreed with Hoxha and Capelleras (2010) and Werber, et al. (2015) that women-owned SMEs in Kigali acquired ICT skills and integrated it in their SMEs and improved their performance which led to growth (see Figure 2.9). Embracing and integrating ICT into SMEs can be a solution or partial solution to constraints facing women-owned business in Kigali and other developing economies. Thus, the third hypothesis is identified and cited.

H_3: There is a negative relationship between constraints faced by women-owned business in Kigali, Rwanda and the use of Internet into women businesses in Kigali, Rwanda to find a solution to those constraints.

Figure 2.9 explains how entrepreneurs shaped with ICT skills, applied these skills into SMEs, which resulted in improving business performance that leads to SMEs' growth.

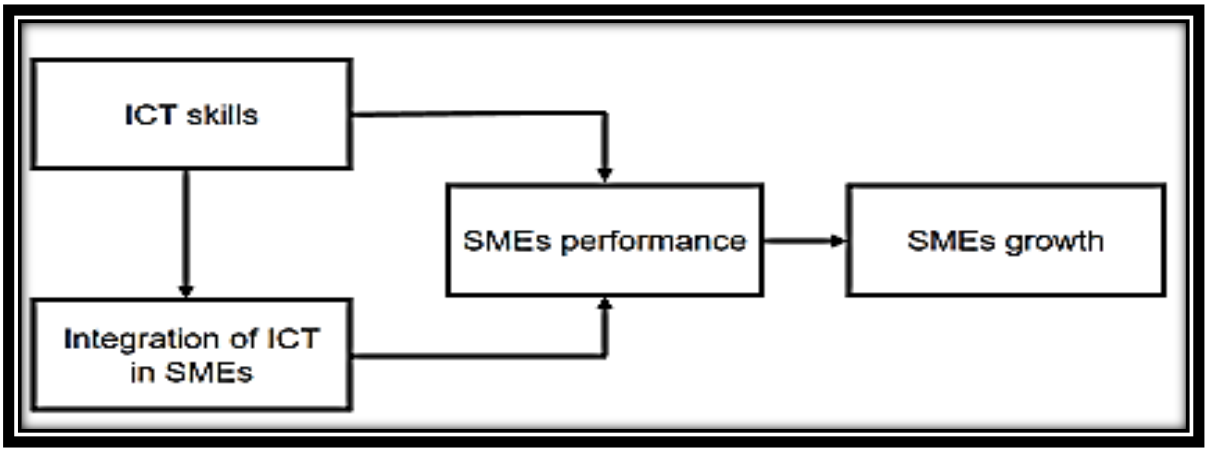

Figure 2.9: Implementation of ICT skills in SMEs (Researcher, 2019)

2.9.27 Challenge of integration information and communication technology in SME

Although ICT changed the world for the better, it also has its constraints such as inappropriateness for the kind of business where women enterprises are relatively small scale, and women find their products and services cannot be sold online. Many ICT programs are too enormous to be used by small scale businesses (Vickery et al., 2004; Jaganathan et al., 2018).

The characteristics of the entrepreneur and their perception of ICT determines their position of accepting or rejecting the integration of ICT in SMEs. If the entrepreneur perceives ICT as innovative technology enabling the improvement of SMEs performance, she will adopt it. Furthermore, sometimes the network does not cover the entire territory, consequently, there is no Internet connection or poor connection. It is the same for the mobile phone, poor network delays business activities (Vickery et al., 2004).

Security and maintenance of ICT tools and software are costly and demand a specialist for maintenance and many entrepreneurs particularly women, cannot afford it (Sarokin, 2019). Despite the challenge of ICT and the credible role in changing the world for the better, it has been used in unlawful activities. These are discussed below.

2.9.28 The downside of information and communication technology

ICT changes and improves the know-how in various industries, including business. People enjoy the benefits that technology offers. However, there are also negative features of ICT such as distracting employees on duty. Many employees spend more working hours on the Internet chatting on social media, reading their emails, news and watching movies, among others. The time spent on unrelated business activities lowers the organisation productivity and costs the organisation extra expenses (Sarokin, 2019). Cybercrime is another downside of ICT. The Internet is the tool cybercriminals use to damage programs of others and to rob private people and organisations of information, including identity, bank account details, and data (Ntirenganya, 2019). The digital technology particularly the Internet is the first choice for human trafficking. Human traffickers use ICT in various illegal activities, including sexual pornography, domestic workers, and amputation of organs (Thorn, 2015). The next section discusses the role government and stakeholders play to ensure the successful integration of ICT among women-owned SMEs in Kigali.

2.10 The Rwandan government and stakeholders' contribution to incorporate ICT into women-owned SMEs in Kigali

The previous section focussed on how ICT can intervene to find solutions to constraints experienced by women-owned businesses in Kigali. This section answers the research question four “Does Rwanda administration and stakeholders’ information and communication technology policies support the successful integration and use of Information and communication technology in women-owned small and medium enterprises in Kigali, Rwanda?” The purpose of this question is to investigate whether the Rwandan administration and stakeholders’ ICT policies support the successful integration and use of ICT in women enterprises in Kigali, Rwanda.

The government of Rwanda is aware of the importance of ICTs in the development of the country. It invests more to ensure a high quality of communication. It also sets policies to govern the utilisation of ICT in the country, which attracts foreign investors in their interested domain. Direct Foreign Investment (DFR) by 2010-2011 invested in various businesses amounted to USD 1 229 750 and ICT covered 51.9% of total investments. Some women-owned SMEs in Kigali benefited from ICT products to boost their businesses (Rwanda. Ministry of Trade and Industry, 2013).

Different stakeholders work together to help women-owned SMEs in Kigali to adopt ICT in their enterprises. Infrastructure and initiatives were created to synergise traditional business practice with ICT among women-owned SMEs in Kigali. Perhaps, women can adopt ICT and conduct modern business and penetrate new industries due to ICT ability to improve business performance and innovation.

This section discusses how stakeholders contribute to integrating ICT in women SMEs in Kigali in terms of information and communication policy. This is done through telecommunication infrastructures, stakeholders' ICT training initiatives among women-owned SMEs in Kigali; women-owned SMEs in Kigali ICT support project integration, and motivation of women entrepreneur role models in ICT.

Figure 2.10 highlights the action taken by the stakeholders to integrate ICT among women-owned businesses in Kigali. Different stakeholders involved in the successful integration of ICT among women-owned businesses in Kigali, Rwanda. They set ICT policy and build telecommunication infrastructure. Women-owned SMEs in Kigali were trained to leverage ICT to improve their know-how, performance and productivity. Different initiatives were created to ensure women-owned SMEs in Kigali embrace and use ICT in their SMEs. They were also networking with successful women role-models and entrepreneurs in ICT to learn from their best practice. Stakeholders promote ICT among women entrepreneurs in Kigali. It suggested positioning their SMEs and closing the digital gender divide in entrepreneurship.

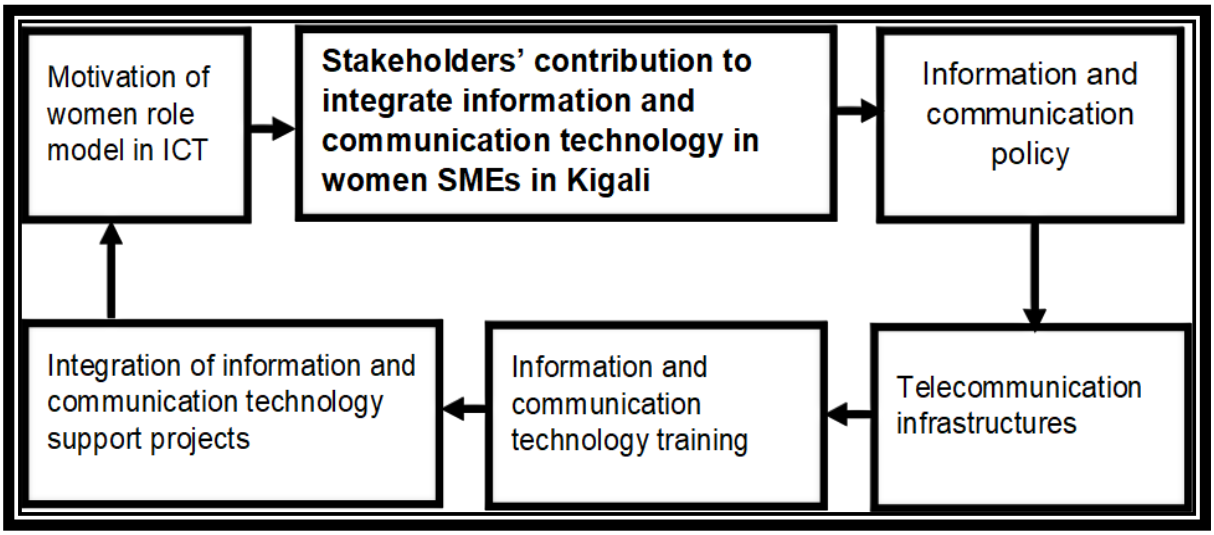

Figure 2.10: Stakeholders' actions to integrate ICT among women-owned SMEs in Kigali (Researcher, 2019)

2.10.1 Information and communication policy

The Rwandan government views ICT as critical in driving sustainable socio-economic development; innovation; industrialisation and creation of job opportunities. The Rwandan ICT Strategic and Action Plan: National Information Communication Infrastructure (NICI) is mandated to ensure a useful and ethical integration of ICT in the country to improve the know-how and competitiveness. This will enable the achievement of the building of telecommunication infrastructures and facilitate telecommunication companies to penetrate the Rwanda telecommunication market (Rwanda. Office of the President. 2015). Interestingly, Mobile Telephone Network (MTN), TIGO and AIRTEL compete in telecommunication on the Rwandan market. Women took advantage to launch businesses related to communication like mobile money, Kiosks selling SIM cards, airtime, data, and cellphone accessories, among others.

The government established the national ICT policy and believed that implementation of the policy in all sectors (agriculture, business, economic, education, health, politics, tourism, and so on) would position the country to lower-middle-income and upper-middle-income, respectively by 2020 and 2035. The aim was to make Rwanda Africa's hub in ICT and globally competitive (Government of Rwanda, 2001; WB, 2009). Rwanda's government acknowledges that the success of ICT national policy relies on its support and responsibility to adopt flexible law for the user, and investors in ICT

(Government of Rwanda, 2001). Rwanda 2020 vision is a road map that drives the country to sustainable socio-economic development. Integration of ICT considered to catalyse the achievement goals and objectives of 2020 vision (ministry of finance and economic planning, 2000; WB, 2009). The government recognises the complexity of ICT and how it provides services to different stakeholders including clients, ICT providers and government. It is crucial having in place ICT policy. Therefore, the Rwandan government established the ICT law as discussed below.

The telecommunication is under the authority of Rwanda Utilities, and Regulatory Agency (RURA) (Rwanda, 2001). It adopts the law governing the ICT N°24/2016 of 18/06/2016 that detailed the obligation and right of every stakeholder (Rwanda, 2016). The law underpins Rwanda's Information Society Authority and determines its mission, organisation and functioning N°02/2017 of 18/02/2017 (Rwanda, 2017). Law No 26/2017 of 31/05/2017 establishes the National Cyber Security Authority and determines its mission, organisation, and functioning (Rwanda, 2017). Thus, the government of Rwanda built telecommunication infrastructure to promote ICT to international standards as discussed below.

2.10.2 Telecommunication and Electricity Infrastructure

Telecommunication infrastructure cannot be separated from power supply infrastructure. This is because the telecommunication requires a source of energy to operate. Therefore, the power supply influences the telecommunication market and distribution. The following section describes the situation of power supply infrastructure in Rwanda.

2.10.2.1 Power supply infrastructure in Rwanda

According to Rwanda. Ministry of infrastructure (2019), 51% of families have access to power, 37% from the government grid, and 14% from the private energy source. It is expected that 100% of Rwandan households would be connected to electricity by 2024. The government encourages the private sector and population to produce power focusing on renewable energy in parallel with the government grid (Rwanda. Ministry of infrastructure, 2018; Rwanda. Ministry of infrastructure, 2019). The government's calls to supply energy also opened an opportunity to women-owned SMEs in Kigali to

extend their business activities in providing renewable energy. The next section highlights the state of telecommunication infrastructure.

2.10.2.2 The situation of telecommunication infrastructure

The Rwandan government believes that improving ICT infrastructure can create new jobs and accelerate socio-economic development. It launched fibre optic, which is characterised with faster Internet that facilitates businesspersons to interact quickly within their networks (Rwanda. Ministry of Trade and Industry 2013). This fibre optic connects Rwanda to international telecommunication submarine cables in the East coast of Africa. It is cheaper compared to the satellite line which was previously used. Thus, fibre optic closed the dependency use of satellite, and at the same time saves a significant wealth that was spent on renting satellite telecommunication line (Lancaster, 2019). The Internet in Rwanda is reliable and modern due to cooperation between the Rwandan government and Chorea Telecom who built Long Term Evolution (LTE) infrastructure. Beal (2019) defines “LTE as a 4G wireless communications standard developed by the 3rd Generation Partnership Project (3GPP) that was designed to provide up to 10x the speeds of 3G networks for mobile devices such as smartphones, tablets, netbooks, notebooks and wireless hotspots.” Three mobile phone companies MTN, Tigo, and Bharti Airtel, competed on the Rwanda telecom market and made an incredible change in doing business. Women-owned SMEs in Kigali use a cellphone in their daily business activities (Rwanda. Ministry of Trade and Industry 2013). According to Rwabugiri (2018), Bharti Airtel bought Tigo and compete only with MTN in the mobile industry. Clients benefit from excellent quality service due to this strong competition between Bharti Airtel and MTN.

But, the price of telecommunication remains high. Having high telecommunication tariff hurts business, it influences more expenditure on telecommunication that reduces operating capital. Telecommunication cost is one of the significant variables international investors investigate before deciding whether they can invest in the country. The Internet and cellphone challenges cultural norms, patriarchy, and stereotypical behaviours that restricted women from physical mobility, networking, and accessing information. Women-owned SMEs in Kigali take advantage of exploiting ICT tools in their businesses without physical mobility despite the high telecommunication tariff.

This is why the expensive data in South Africa pushed the government to intervene and demanded that the giant telecommunication companies VODACOM and MTN cut data cost 30% - 50%, failure to do so will lead to prosecution (Omarjee, 2019). Rwanda should apply South Africa's best practice and demand telecommunication companies to cut price. The MTN in Rwanda is a branch of South Africa MTN and therefore cutting prices should not be limited to South Africa but should be applied to Rwanda as well. Therefore, women entrepreneurs in Kigali and the population in general, can enjoy the use of ICT at an affordable cost. The following section discusses various initiatives to integrate ICT into women-owned SMEs in Kigali.

2.10.3 Stakeholders ICT training initiatives among women-owned SMEs in Kigali

Twahirwa (2014) noted that the only way to overcome the digital gender divide in ICT is in the hands of women. But, the author ignore the reality, patriarchy and stereotypical pressure facing women-owned businesses in Kigali. Therefore, it is suggested that women must obtain full support from society and government. Otherwise, the gender digital divide will remain. Trained and educated women in ICT may help their colleagues to improve their ICT skills and integrate it into their daily businesses activities. They might motivate them also to penetrate tech business (Goldman Sachs, 2018). A tech company is a business which provides products and services related to technology (Wikipedia, 2019). Providing women-owned SMEs in Kigali with ICT skills is also an excellent move to achieve the UN sustainable development goals by 2030, a strategy aimed to eradicate poverty (UN, 2016).

The Rwandan government targets women to be fully involved in ICT through education, business, agriculture and other sectors. This is why the government gives more opportunities to a large number of women to attend science and technology higher education, however, few of them complete their studies. The government encourages stakeholders to create funds for women entrepreneurs and train them to integrate ICT in their enterprises (Government of Rwanda, 2001). It believes that sustainable ICT skills can be taught to young and older people. The government launched One Laptop For Child Project that teaches ICT programmes and gives laptops to every primary school child (Rwanda, 2011).

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) (2019) shares the same view with the Rwandan government about the integration of ICT in Rwandan society with a focus on women enterprises, empowering them so that they can conduct modern businesses and penetrate the tech industry which is dominated by men entrepreneurs. This is why GIZ supports programmes empowering women-owned SMEs in Kigali and perspectives of women entrepreneurs in software development and data analysis. It trusts that providing a more profound ICT training programme to women may make a change in the patriarchal society, decrease gender digital divide, and improve women's opportunities in the tech industry. However, only 300 hundred women benefited from this initiative, despite a large number of women running businesses in Kigali. It is suggested that other stakeholders should engage in programmes like this to increase the number of trained women who can cope with the current business environment and digitalised services. This move contributes towards closing the digital gender divide (GIZ, 2019).

Excitingly, International Trade Center's 'SheTrades' moved to another direction to connect women-owned businesses in Kigali to global networking. In doing so, they improved women-owned SMEs ability to survive the pressure of artificial intelligence and digitalised businesses of fourth industrial revolution (Bishumba, 2017).

The International Trade Center's 'SheTrades' is aware of how women-owned SMEs in Kigali work hard to improve business activities and move towards large businesses. However, lack of networking hampers the achievement of their entrepreneurial ambitions. To remove this constraint, She Trades' launched a networking application which can connect them to the global market through ICT. They can interact with successful women entrepreneurs, advertise their products and services, look for new markets, network, and learn the best business practices and online training. This product provides women with the opportunity for networking wherever they are. However, most women SMEs in Kigali are small-sized. This leads to the question "Do women-owned SMEs in Kigali really benefit from She Trades' networking application? Besides this, the majority of them could not speak and write English. How are they going to network? Therefore, those educated in running small and medium enterprises should take advantage of this Trades' networking application to improve their management, find new opportunities, and extend their markets. Perhaps this networking application will need a software tester to ensure a smooth function

(Bishumba, 2017). The We Code initiative targeted women to gain software tester skills to run businesses in this industry, which is dominated by male entrepreneurs. A software tester is a person who monitors whether the application works appropriately; she can manually or electronically fix the problem which occurs in software application function. They are also a member of the software developer team. Software testing attracts vigilance and perseverance of trainees. This can enhance focus, determination, and leadership skills of women-owned SMEs in Kigali (Kaliisa, 2019).

Broadcasters of ICT (2019) reported that women represent only 12% of the software development industry. However, Rwandan females are thirsty to embrace ICT. Broadcasters of ICT believe that building the capacity of women in ICT will result in the skills in penetrating tech businesses and enabling women to be self-employed in ICT and even compete with men on the ICT labour market. Broadcasters of ICT launched an initiative "Girl's boot camp" to train women in software development. This initiative expects to increase the number of women in software development domain, while reducing the gender digital divided gap. Besides training programmes, there are also projects funds to support the integration of ICT among women-owned SMEs in Kigali. These projects are addressed below.

2.10.4 Project support integration of ICT into women's SMEs activities in Kigali

The previous section focused on empowering women in ICT. This section emphasises the projects that support the process of integration of ICT among women-owned SMEs in Kigali. Different stakeholders stand together to ensure that women-owned SMEs in Kigali embrace and adopt ICT. TradeMark East Africa (TMEA) and PSF launched a long-term project of USD 2.26 million for the first phase of four years to support women's SMEs to extend their business on the international market through exportation (Taarifa, 2019). This project provides the beneficiaries with a full package, including finance, integration of ICT in their businesses to enable them to search critical information needed to facilitate their export success.

To achieve this, the women-owned SMEs received ICT training and entrepreneurship about export services. The TMEA and PSF believe that supporting women-owned SMEs grows and empowers them in ICT and lift their SMEs to the same level of men

SMEs, decreases the gender digital divide while improving gender parity (Taarifa, 2019). The question raised here "What unique products are women entrepreneurs in Kigali going to export"? It would be better first to promote innovation, quality control, and standardisation to meet the international demand. The New Times (2017); Essa (2018) and Frank (2018) complain about the lower quality products made in Rwanda, which is challenging to compete in the global market. The quality requires improvement to meet international standards.

At the same time, Bharti Airtel, a Rwandan telecommunication company, is running a project "Connected Women Commitment Initiative" involving women in the mobile money business. This project encourages women to adopt ICT and train selected women, entrepreneurs, all over the country on how to operate mobile money application in business transactions such as sending and receiving money, buying water and electricity and paying taxes.

Three hundred women entrepreneurs started the project, and it is expected that 1280 women would benefit from the programme by 2020. Bharti Airtel, in collaboration with The National Women's Council of Rwanda, created a fund that provides capital start-up for mobile money businesses and continues coaching to ensure women beneficiaries succeed. The beneficiaries report a better socio-economic change in their families and community. Bharti Airtel management evaluation indicates that the project is going well while decreasing the gender digital divide. But, very few women benefited (Muhura, 2017). If women do not participate fully in entrepreneurship, there will be limited sustainable socio-economic development. Women's SMEs need to grow in the local markets and penetrate the international markets. ICT has started the SheTrades initiative which intends to connect at least three million women entrepreneurs to the global market by 2021. This initiative was launched in Rwanda in 2015. It provides Rwandan women-owned SMEs access to ICT SheTrades application. It empowers women entrepreneurs to the international level and enables them to extend their business to the international market. Through this application, they can connect to the top global successful women entrepreneurs' model.

They can learn best practice from their experience, which may help them grow their SMEs. Women entrepreneurs can participate in online international training, conferences and workshops without mobility. The ICT SheTrades initiative provides

coaching, business information and networking among women entrepreneurs all over the world. MTN Rwanda the biggest mobile telecom company in Rwanda, actively supports ICT SheTrades initiatives to connect Rwandan women-owned SMEs and prospective future women entrepreneurs with the world of business.

To ensure the success of this initiative, MTN provides a free of charge service to every women entrepreneur or prospect who logs into ITC SheTrades application (MTN Rwanda, 2015; Hope Magazine, 2017). Women-owned SMEs in Kigali obtain support to adopt ICT in their SMEs, and successful women entrepreneurs motivate them to embrace ICT to enjoy its advantages in improve SMEs productivity. This is presented in the following section.

2.10.5 The motivation of women entrepreneur role model in ICT

The previous section discussed how different projects support the integration of ICT in women-owned SMEs in Kigali. This section presents the motivation brought by successful women entrepreneurs and how ICT contributed to their achievements. Akaliza Keza Gara, young female entrepreneur graduated from multimedia technology, has a business technology passion and believes that ICT belongs to both men and women. She launched a tech media company (Shaking Sun). Due to her performance and success in the industry, she was appointed among four Africa advisors for Microsoft by 2012. She encourages her fellow girls and women to embrace ICT. She and other successful women-owned SMEs in Tech in collaboration with the government launched an initiative that motivates women to enter the ICT business (Twahirwa, 2014). This stakeholders' initiative allocates grants to support Research and Development (RD) for creative and innovative women in ICT. This initiative also helps them to market their innovation. Therefore, the government has a dual objective in this initiative. First, to encourage the skilled female to take advantage in ICT to conduct research; innovate while increasing the number of women able to find a job on the labour market; teach their peers, children and relatives.

Secondly, motivate females to join the Tech business, which is dominated by males. To realise this initiative, the government opened an ICT laboratory where women are enjoying the training and research activities. However, females are still undermined with a patriarchal and stereotypical society, which attribute ICT a male course

(Twahirwa, 2014). Therefore, it is expected that the acquired ICT skills among women-owned businesses in Kigali do not limit their business. Furthermore, the community should benefit from them improving their skills and developing a competitive edge.

The future of business is deemed to be more automated and this requires women entrepreneurs in Rwanda to embrace ICT and face the fourth industrial revolution. Girls in ICT Rwanda initiative was launched by a women scientist who regularly visits female schools. It targets girls in early education primary and secondary to interest them in the importance of adoption of ICT, and the positive impact ICT has in the labour market and entrepreneurship in tech.

This motivation may increase ICT and entrepreneurship intention among girls, and those who have the opportunity to pursue tertiary education may choose ICT related courses. Girls in ICT Rwanda believe that having more women shape ICT skills can work alongside the men and be judge on their performance and achievement instead of their gender affiliation. SMEs in tech may increase the number of vibrant and innovative women entrepreneurs. Besides these, women can challenge patriarchal norms and the stereotypes in fighting for gender equality, showing that they can do what men do in the ICT field (Gara, 2013). The discussion in this section shows the policy governing ICT and different initiatives taken to ensure capacity building in ICT, integration, and use of Internet of things and cellphone in women-owned enterprises in Kigali. Thus, the fourth hypothesis is identified and cited.

H_4: There is a positive relationship between stakeholders' ICT initiatives and effective integration and use of ICT in women enterprises in Kigali, Rwanda in order to ensure competitiveness.

2.11 Summary of this chapter

Entrepreneurship knows as the most jobs creation and social-economic development. Women-owned businesses in Rwanda contributed to GDP 30%, and they own 29% of total formal businesses in Rwanda (Musomandera et al., 2015; Rwanda. National Institute of Statistics of Rwanda, 2018). However, their motivation to start enterprises differs based on the situation in which they are experiencing and their ambition to embrace entrepreneurship.

This motivation is categorised in the push and pull factors. Push motivational factors are associated with a severe condition of poverty, for instance lack of income, divorce, unemployment, and widowed women in which women push themselves to start a business to survive because they do not have another source of income. They have difficulties in finding capital start-up; they rely on borrowing money from family and friends to launch a business. Perhaps, this is why their enterprises are tiny in size and called necessity entrepreneurs.

Pulled entrepreneurs also called an opportunity entrepreneurs have income, they identify an opportunity, and they shift from their current occupation to pursue the opportunity. Their businesses are often bigger compared to the necessity entrepreneur. Among women-owned businesses in Kigali, there are pushed and pulled entrepreneurs. But, both necessity and opportunity entrepreneurs contribute actively to socio-economic development.

However, they encounter constraints in their business career. These include cultural, financial, cognitive, technology, and competition. However, embracing and integrating ICT into their businesses might be solution or part solution to constraints they face. It is argued that successful integration of ICT into business improves performance and the competitiveness that leads to business growth and sustainability. To achieve these, the stakeholders brought together finance, material, know-how among others to promote ICT among women-owned businesses in Kigali to enable them to use and integrate ICT in their SMEs.

The following chapter emphasises the ICT theories and models adoption.

CHAPTER THREE
MODELS AND THEORIES UNDERPINNINGS

3.1 Introduction

The previous chapter discussed the literature review. This chapter addresses the theoretical models that originated from the body of knowledge and therefore, were used to build the suggested conceptual model of this research. Few studies have addressed the importance of ICT among women-owned SMEs in developing countries. The aim of the research is, therefore, to expand the body of knowledge on women entrepreneurship by adopting ICT among women-owned SMEs based on proven conceptual models. Therefore, adoption of ICT emerged from different theories including Actor-Network Theory (ANT), Technology Acceptance Model (TAM), Diffusion of innovations (DOI),Technology-Organization-Environment (TOE), and The unified theory of acceptance and use of technology (UTAUT) (Eze et al., 2014). These theories are discussed in section 3.2.

3.2 Technology Acceptance Model

Technology Acceptance Model (TAM) is a technology system that created a model which attracts individuals and organisations to use new technology. The acceptance of new technology is related to the individual attitude which stimulates Behavioural Intention (BI) to adopt new technology. The model indicates that when new technology is presented to people, their attitude of how and when to use it differs. Therefore, Perceived usefulness (PU), Perceived ease-of-use (PEOU), and external variables are factors that influence decision making of technology adoption (Davis et al., 1989).

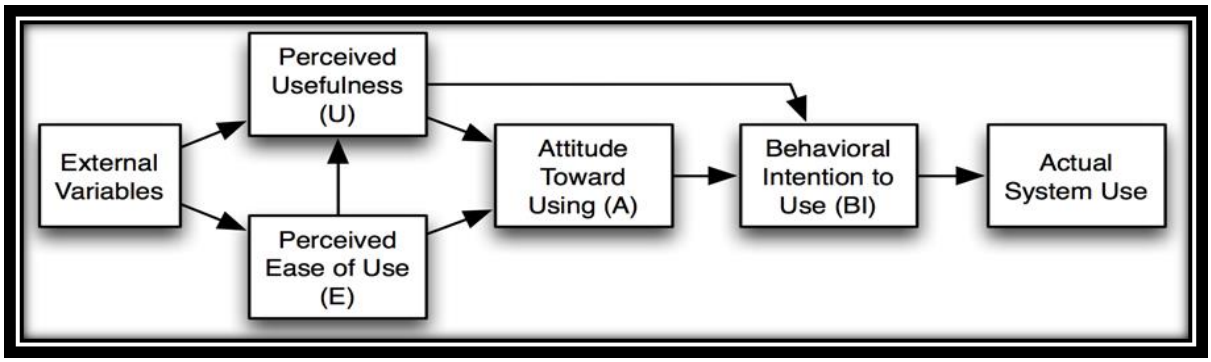

Figure 3.1: The Technology Acceptance Model (Davis et al., 1989)

Figure 3.1 indicates the process of technology acceptance. With Perceived usefulness, the prospector user analyses to which extend the new technology can improve the business performance and whether the new technology enables what it wants a business to do. On the other hand, Perceived ease-of-use believes that it is facile and relaxing to use new technology, then it is adopted. This group of people are educated, have ICT skills, and adopt an innovative technology attitude (Thatcher & Perrewe, 2002; Venkatesh et al., 2003). Finally, external variables refer to social influence, including gender and age. The society determines the attitude of his member towards the new technology. If new technology meets their expectation, they will adopt and use it. But the adoption might differ from factors like gender, age, income, and education (Davis, 1989; Venkatesh et al., 2003). TAM has been used in many SMEs.

3.2.1 Information and communication technology acceptance in SMEs

Adoption of ICT into SMEs has shown a competitive advantage (WEF, 2012). The role of ICT in the SMEs is equivalent to that of electricity in the manufacturing sector (German. Federal Minister for Economic Cooperation and Development, 2013). The competitive edge and market performance depends on how SMEs adopt ICT and the successful adoption of ICT can lead to outperforming competitors (Goswami & Dutta, 2015).

The adoption of new ICT into SMEs depends on top management's attitude toward ICT. Since the top management views the new ICT as valuable to the business, performance, and sustainable growth, ICT is adopted. Management must also support the implementation of new ICT into SMEs to ensure a successful implementation and use among employees (Thong & Yap, 1995).

However, employees' resistance, lack of ICT skills, and perceived usefulness were identified as obstacles that hamper the adoption of new ICT. Management has the responsibility to explain the benefit of new ICT to employees for business to change their attitude to adopt new technology. Perhaps, employees can be empowered in ICT starting with those who actively reject the adoption of new ICT. Ghobakhloom et al. (2010) add that employees training should be literacy focussing on their job attribution; there is no need to be a specialist. The adoption of new ICT is attributed to the power of top management to make a decision on the usefulness the new ICT (Irani et al.,

2001; Nguyen, 2009). However, management, employees, and satisfaction synergise the adoption of new ICT and its success. Furthermore, the top management, middle, and first-level management should have the same attitude and perception toward new ICT adoption, and the changes it will to bring to the organisation and employees. Since they have the same view towards new ICT, the implementation and use will succeed and the new ICT product will position SMEs (Davis, 1999).

Ajibade (2018) observed that the TAM is practical for a solo entrepreneur or individual more than an organisation. This is because a friend or a colleague can influence another one through word of mouth to adopt new technology since he/she adopted it and values its usefulness. Also, advertising might attract an individual to adopt new technology. Despite the TAM quality, it also has limitations which are discussed below.

3.2.2 Criticism of the technology acceptance model

TAM emphasises the particular user of ICT with the idea of perceived usefulness, extending it to incorporate more and more variables to understand how the user perceives usefulness and disregards the basic social mechanisms of ICT development and implementation, whether more technology is potentially superior, and the social implications of ICT use. The model did not look to other factors that cause perceived usefulness and ease of use, for instance, government policy and cost (Lunceford, 2009). Therefore, TAM is not an appropriate model to apply among women-owned SMEs in Kigali as they need a model that allows them to comply with government policy. For instance, online business registration and paying taxes.

Recent studies rejected the hypothesis of the influence of perceived ease of use on SMEs adoption of new technology (Okafor et al., 2016; Li, 2020). The TAM is based on BI to demonstrate the feasibility of adopting new ICT within the organisation; however, behaviour cannot be measurable. In contrast, a friend can influence another one to adopt new ICT based on their social relation (Ang et al., 2015).

TAM is also criticised for not taking into consideration the individual traits that influence BI to adopt new ICT. Therefore, it may be argued that evaluating behaviour is highly challenging since secret personality characteristics also inspire behaviour. Consequently, future consumers of technology do not automatically focus their

adoption of and ability to use modern technologies on their expectations of the utility of ICT and how convenient it is to use. However, the paradigm may indicate that there may be other extremes (Zahid et al., 2013). Thus, the researcher provides a synopsis of some models and theories applicable to ICT individual or organisation adoption. Arpaci et al. (2012) suggested that due to the complexity to understand ICT adoption, it is important for a researcher to introduce different models and theories in order to explain ICT adoption better, and later focus on the ones underpinning the study. Therefore, all models and theories do not apply to this study. Despite the content of this study, TOE is an appropriate model that could be applied to the study to help women-owned SMEs in Kigali and elsewhere in developing economies to overcome the constraints they face. The details will be provided below when the researcher highlights the motive behind choosing TOE. The next section discusses the Technology-Organization-Environment (TOE) theory.

3.3 Technology-Organisation-Environment Theory

The Technology-Organization-Environment (TOE) framework (See Figure 3.2) was developed by (Tornatzky & Fleisher, 1990). This identifies factors that affect technology adoption and its probability. TOE outlines the method by which a company adopts and executes “technological innovations that are influenced by the technological, organisational, and the environmental context” (Tornatzky and Fleisher 1990). TOE is “an interdisciplinary framework that offers a holistic and direct theoretical foundation since research into the adoption/diffusion of ICT typically assesses numerous technological, organisational and environmental factors that help or hinder adoption or diffusion” (Baker, 2012). It has been used to illustrate the adoption of several innovations (Baker, 2012). Tornatzky and Fleisher’s (1990) book comprehensively explained how the adoption of ICT in the organisation embraces innovation in a micro and macro-environment context. These include technology, organisation, and environment context (Baker, 2012). Section 3.3.1 discusses the technology context.

3.3.1 Technological context

The technological context refers to those technologies available and being used. For instance, women-owned SMEs in Kigali are actively using cellphones and the Internet.

It also extends to available technologies but is not yet used within a business. For instance, women-owned SMEs in Kigali do not use software such as TaxSlayer, TurboTax and H&R Block to pay taxes (Baker, 2012).

Ramdani et al. (2013) argued that the adoption of ICT and Enterprise Application (EA) had shown many benefits for SMEs, not only in cutting price but also driving SMEs towards growth and sustainability. Interestingly, an essential number of SMEs embraced ICT and became large enterprises.

Baker (2012) observed that entrepreneurs viewed the existence of innovation outside the business. Technology has the power to indicate which appropriate technology is needed to launch innovation. Innovation is critical to maintaining business competitiveness. Ramdani et al. (2013) argued that large firms are more innovative than SMEs. Large firms have more opportunities than SMEs to adopt ICT because large firms have talented and educated employees and access to capital. SMEs play a critical role to serve the community and create a niche market. SMEs need to adopt ICT at their level of business. SMEs are also a large corporate agency who hire talented employees.

Tushman and Nadler (1986) identified three categories of innovation. These are incremental, synthetic, and discontinuous changes. In the incremental category, a business adds features to existing technology or change the version that adds value to the organisation; for example, updating PCs from word 7 to 10 version.

Synthetic innovation changes or moderates the current ways of using technology by adopting another method. For instance, at the time of writing this thesis, the world was exposed to the unprecedented Covid-19 pandemic. Many South African universities shifted from traditional teaching-learning to e-learning.

Finally, an innovation provides discontinuous changes and abandons the current technology to introduce a new one that is refered to as radical innovation. Thus, a firm should analyse the change of technology carefully by considering the benefits and challenges of new technology. The next section introduces the organisational context.

3.3.2 Organisational context

The organisational context is considered as a critical player in ICT adoption and EA. This because the employees can accept or reject the adoption of ICT within the organisation. Some employees prefer to continue working as before; they are not ready for a change to embrace technology. The top management of organisations must support the adoption of ICT into the business and monitor its utilisation to identify challenges associated with the adoption of ICT (Premkumar, 2003; Jayaraj et al., 2006).

Cragg and King (1993) reported that lack of ICT skills and cost of technology are significant obstacles in SMEs adoptimg ICT and EA. Kuan and Chau (2001) observed that ICT experience determines the upcoming type of technology SMEs adopt. Dholakia and Kshetri (2001) assert that ICT existing within SMEs stimulates future technology adoption. However, incremental change necessitates skills and embracing the Internet of things. Since most SMEs already possess a computer or smartphone, new technology could be cost-effective. Baker (2012) observed that in large firms, employees quickly adopt ICT; they are inspired by intrapreneurship innovation. Rewarding those who embrace ICT and sharing information within the organisation has shown to be a positive stimulus for the entire organisation to work as a team to ensure the successful adoption of ICT, EA, and innovation. Section 3.3.3 discusses the environmental context.

3.3.3 Environmental context

The environmental context refers to those environmental challenges in business including competitors, government policies and technology. Nowadays, businesses compete on the utilisation of sophisticated technology; it seems that an entrepreneur who adopts more significant technology associated with active management, takes advantage of the market environment (Martinez & Nguyen, 2014).

Most innovation and invention rely on technology adoption. The launch of innovation in the market, affects the market environment. Due to innovation technology power, it imposes market share; influences consumer behaviour, and it attracts consumers to gain the patronage of new products or services (The United Nations Conference on

Trade and Development (UNCTAD), 2014). Adoption of innovation technology may drop the sales of existing products or services, and sometimes deletes an existing product or service on the market. It influences competitors to adopt new technology enabling innovation to market share. Therefore, the adoption of ICT and EA become vital tools for competitive advantage.

Government legislation may either have a beneficial or harmful impact on innovation. As policymakers place new restrictions on industry, such as “requiring control systems for energy firms, innovation is effectively man-made for those firms. Similarly, strict safety and testing requirements can delay innovation in industries, for example, in the construction where new material must be tested before being used” (Tornatzky et al., 1990). Policy legislation may therefore, either promote or hinder innovation. All in all, these three components - technological, organisational and environmental, pose both limitations and incentives for technical advancement and such elements affect the firm's degree of technological innovation (Tornatzky & Fleischer 1990). Section 3.3.4 offers the critiques of the TOE theory.

3.3.4 Criticism of Technology-Organisation-Environment Theory

While large enterprises are subject to many of the constraints, the impact on small enterprises is more considerable. The skills and time needed for planning are not significant problems for large enterprises, yet these challenges represent most of the complications for small businesses. TOE may not be suitable for small businesses instead of large businesses (Cohn & Lindberg, 1972; Thong, 1999; Imre, 2017).

Small enterprises struggle from a particular circumstance frequently known as resource poverty. Resource poverty is the result of a variety of conditions that are exceptional to small businesses, such as running a business in a highly competitive market, financial limitations, lack of professional skills and sensitivity to external forces. Due to these unique circumstances, small enterprises are associated with severe restrictions on financial resources, a lack of in-house ICT expertise and a short-term management perspective. Small businesses thus face considerably more obstacles to ICT adoption (Welsh & White, 1981; Imre, 2017).

Small and medium-sized enterprises are less likely to adopt ICT than large companies. They argue that, even among small businesses, the larger the business, the more capable it is to recruit staff with relevant skills, such as ICT knowledge. Also, it seems logical to assume that larger enterprises have more possibility to use ICT than smaller enterprises.

ICT is a sophisticated technological innovation requiring a significant expenditure of cash flow for a resource-rich small business. If the ICT integration is not successful, a small business that is reliant on the ICT could struggle irreversible loss from which it may not recover (Thong, 1999; Imre, 2017).

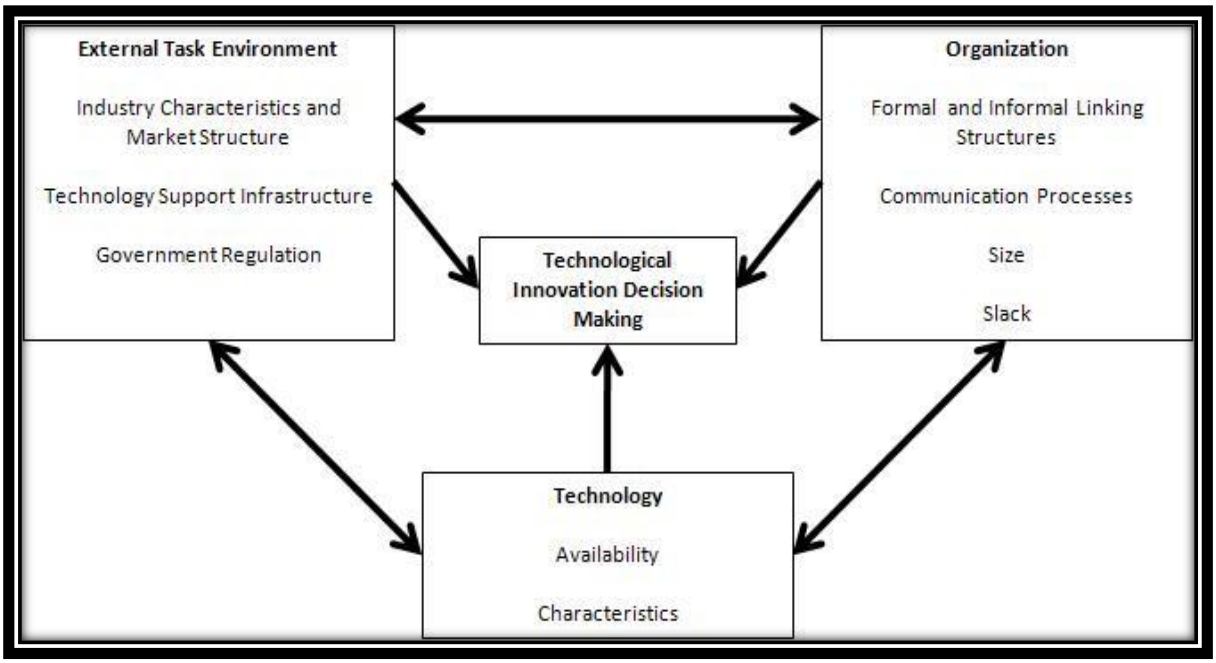

Figure 3.2 Technology-Organisation-Environment model (Tornatzky et al., 1990:1)

3.4 Diffusion of Innovations Theory

Diffusion of Innovations Theory (DOI) was developed by Everett Rogers (Rogers, 1962). It is a theory that attempts to clarify how, why, and at what level new ideas and technology spread. Diffusion is the mechanism by which innovation is transmitted over time to the social network participants. Innovation is a specific term, compared to the existing expertise of the unit being analysed. Any idea, practice or object that is viewed as new by a person or other unit of adoption might be deemed an innovation available for research. DOI theory is not only limit to technology adoption; it also extends to many

disciplines (Rogers, 2003). The diffusion of innovative new technology has shown divided opinions among individuals, SMEs, and various organisations. Therefore, the adoption of new technology requires an in-depth assessment to decide whether the innovative new technology is accepted or rejected. Rogers (1962) and Newell (2001) indicated five steps of technology adoption respectively and knowledge or awareness is where an individual or organisation is told about innovation technology, but did not have enough information about it with regards to the value it can add to the business.

Since management knows the features of innovative technology and how it can improve the functionality of business, the persuasion step is raised to search for more information and analyse them to make a decision. Some cloud service provider gives a trial to clients to test the features of technology, while convincing them about the qualities to purchase it. The third step is a decision which is a critical step in this process because the management or individual considers the benefit and limitation of innovation technology to adopt or reject. Since accepted, the innovation technology is implemented into the business, but, at this level, the adopted innovation may not be productive; the clients ask further information to ensure a successful integration. Finally, confirmation/ continuation, the client made the final decision to use the innovation technology (Rogers 1962; Newell, 2001).

The question raised here is “why does an organisation adopt innovative technology?” the answer is that the management adopts innovation technology because it can use it to take advantage of the market over the competitors or it can increase the business market share. Therefore, the adoption of innovative technology positions the business (Ayong & Naidoo, 2019).

Five elements intervene in the diffusion of innovation. These are innovators who take the risk to invest money in the adoption of new technology. Adapters (early adopters, early majority, late majority, and Laggards) who adapt technology in a different time. Communication channels used to convey the message or signal of innovation technology. Time refers to the period needed to adopter innovation technology. Finally, a social system that influences direct or indirect diffusion of innovation, including government and mass media (Rogers, 1962).

As indicated in the introduction of DOI theory, the literature detailed what innovative technology is and what it purports to do for individuals or organisations and why organisations adopt innovative technology. Diffusion of innovation technology can position business and anticipate future uncertainty. Despite the quality of DOI, it also has critics. This will be discussed below.

3.4.1 Criticism of Diffusion of Innovations Theory

Diffusion is hard to measure because human and human networks are sophisticated. It is incredibly challenging, if not impossible, to quantify the real reasons for the adoption of innovation. It is also criticised for convincing consumers that all innovation technologies are relevant and should be adopted (Lyytinen & Damsgaard, 2001). The flow of information goes one way. The innovator persuades the client to adopt innovative technology; there is little or no inverse flow (Giesler, 2012). Many women-owned SMEs in Kigali run micro-enterprises that sell standard products and service, and they are less educated to adopt DOI. This technology adoption looks complex to their businesses to use. The next section discusses Actor-network theory.

3.5 Actor-Network Theory

Prior researchers like TAM and DOI have devoted to technology adoption studies over the years but have gaps in capturing continuous technology advances and the complex nature of technology adoption and diffusion. That is why the ANT theory emerged to address the integration and dynamism of ICT into the SMEs in society (Eze, et al., 2014).

Callon and Latour (1981) are known as ANT theory designers. ANT is a social theory that views human (social) and no-human (technical) as actors on the network. They believe that human and no-human support is compulsory to ensure ICT adoption success into the SMEs. Marres (2004) adds that ANT is impartial; it studies the role of society in technology adoption and how technology and society influence each other. However, the power should be managed equally to achieve the goals and objective of SMEs.

Eze et al. (2014) stated that ICT is dynamic, not a statistic; it changes over time to meet the current pressure of the external business environment. The role of society as an actor is crucial to contribute to the process, accept the change and implement it. Thus ANT provides a solid knowledge to understand the relationship between society, artefact and the technology-in-practice.

Tatnall and Burgess (2020) argued that the adoption of ICT into SMEs is not enough to be competitive. Also, It must receive adequate and efficient management support of humans for instance employees, consumers, management and no-human for instance cloud computing, Internet, software the cellphone that leads SMEs to the invention, innovation, and competitive advantage. Thus, the process of ICT adoption happens in the inscription, translation, and framing (See Figure 3.3). These are detailed below.

3.5.1 Inscription

The inscription is a mechanism in which the actors create values about technology or the degree to which the innovators decide or articulate what the technology or its usability could be (Faraj et al., 2004). The inscription mostly inspired by the beliefs of an organisation, prior trends of use of ICT, and expectations (Callon, 1981).

3.5.2 Translation

The translation is a process of positioning the multiple benefits and beliefs of the various actors within the network (Callon, 1984). It concerns comprehension of “how actors seek the benefits of other human actors or persuade others, explicitly or implicitly, to adopt new technologies” (Callon, 1984). It is significant to mention that in a condition where there are a lot of key players trying to ensure that other actors hold up their claim (Sarker et al., 2006).

3.5.3 Framing

Faraj et al. (2004) stated that new technologies are undergoing reversal or modification, even though they require excellent characteristics to enhance their current features. This frequently allows for the emergence of new or various ways of utilising these technologies. Such technology is often not successful if users do not understand the manner in which it is constructed and used.

3.5.4 Stabilisation

Stabilisation refers to actors acknowledging that the issue was solved. However, ICT is dynamic, and actors should update the technology when it is needed to keep its efficiency and competitiveness (Eze et al., 2014). These four concepts discussed above explain the dynamic process of ICT adoption.

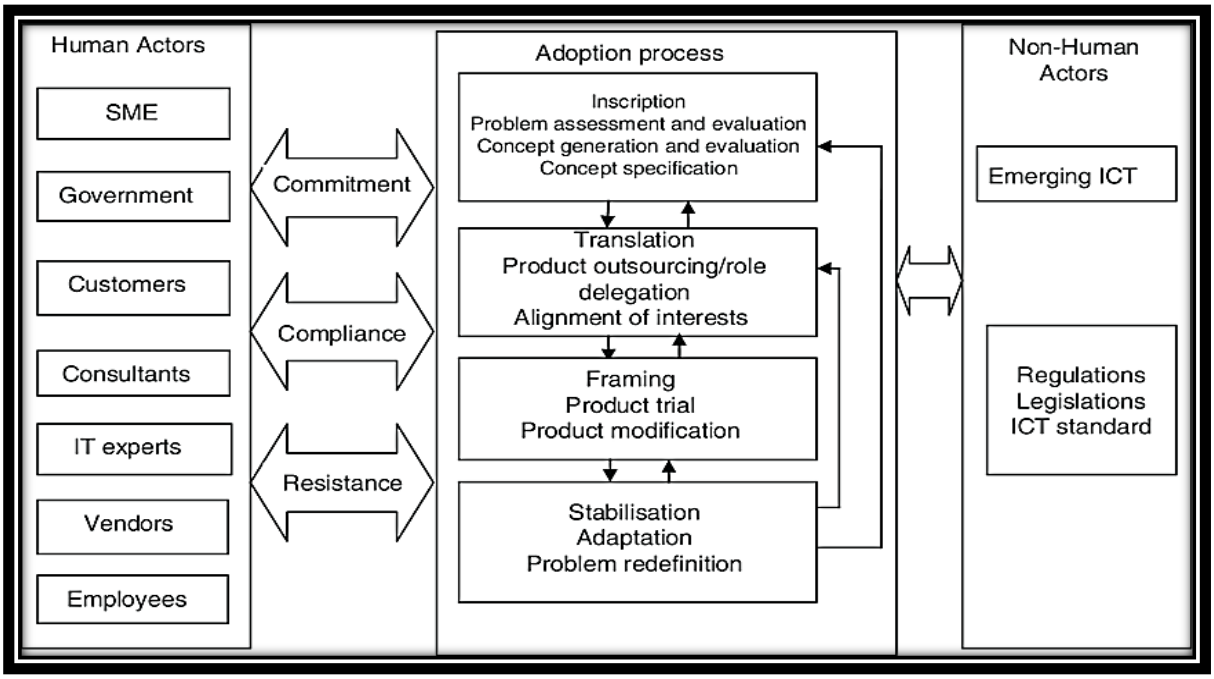

Figure 3.3: The dynamic process of ICT adoption in SMEs (Eze et al., 2014)

3.5.5 Criticism of Actor-network theory

The ANT is criticised as being more social constructivism. It brings human and ICT on the network to understand their interaction in the adoption of ICT. It is known for its contentious insistence on the ability of non-humans to act on networks. ANT is also

linked with strong criticism of traditional and logical sociology that is not an appropriate technology adoption among women-owned SMEs in Kigali. Also, it is criticised to stand on an equal relationship between human and non-human to adopt successful ICT in SMEs. But it ignores future invents, for instance, innovation (Muniesa, 2015). Whittle and Spicer (2008) strong criticise ANT for ignoring the nature of knowledge and how knowledge is obtained by promoting the unfolding nature of reality that considers the bounds of knowledge.

The next section highlights the unified theory of acceptance and use of technology (UTAUT).

3.6 The unified theory of acceptance and use of technology

Venkatesh is known as a designer of the unified theory of acceptance and use of technology (UTAUT) which is an ICT acceptance model. Through a unified perspective, UTAUT attempts to clarify user expectations for the use of an ICT and resulting usage behaviour. Theoretically, there are four fundamental constructions, respectively, performance expectancy, effort expectancy, social influence, and facilitating conditions (Venkatesh et al., 2003).

The first three are variables of user motive and behaviour, and the fourth is a variable of user behaviour. Gender, age, experience and voluntariness to use have been designed to moderate the impact of the four critical constructs on the purpose of use and behaviour. The construct of theory and model were generated from the summary of existing height theories on individual adoption technology. These theories and models are the theory of reasoned action, TAM, the motivational model, the theory of planned behaviour, a joined theory of planned behaviour/TAM, a model of personal computer use, DOI, and social cognitive theory. The findings of a longitudinal study revealed that UTAUT outperforms other height models at 70% in BI versus around 50% in technology use (Venkatesh et al., 2003). The correlation between these constructs can be seen in Figure 3.4.

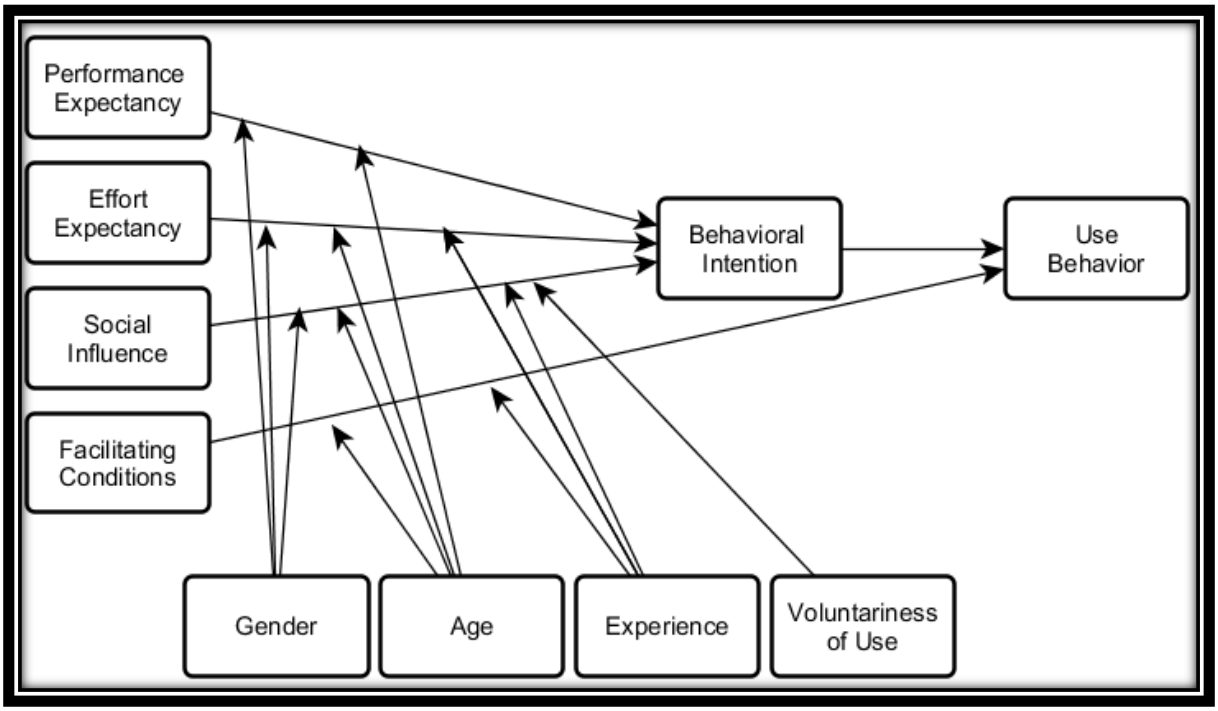

Figure 3.4: Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003:447)

Figure 3.4 describes the UTAUT model below.

3.6.1 Performance Expectancy

Performance Expectancy (PE) is the level to which a person expects that the use of the program will help him/her achieve job performance gains. The impact of success expectancy on behavioural purpose is believed to be influenced by gender and age; for men, especially younger employees and such an effect should be more significant (Venkatesh et al., 2003; Al-Qeisi, 2009).

3.6.2. Effort Expectancy

Effort Expectancy (EE**)** is the extent of ease related to the application of the system. The impact of effort expectations on behavioural intentions is assumed to be reasonable in terms of gender, age and experience; this would have a more significant impact on young females and aged employees at a preliminary phase of experience (Venkatesh et al., 2003; Al-Qeisi, 2009).

3.6.3 Social Influence

Social Influence (SI) is the level to which a person perceives that significant others assume he/she could also use the new program, is Social Influence (SI). The effect on behavioural intentions of social factors is presumed to be influenced by gender, age, voluntariness and experience; such an impact would be higher among women, especially in compulsory settings in the initial phases of experience (Venkatesh, et al., 2003; Al-Qeisi, 2009).

3.6.4 Facilitating conditions

Facilitating Conditions (FC) is the level to which a person claims to believe that there is an organisational and technical facility to promote the utilisation of the system. The enabling circumstances become unimportant when both performance expectation and effort expectation constructs are present. With technology practice, this impact is forecast to expand as users find several avenues to support. The effect of facilitating conditions on use is therefore assumed to be moderate in terms of age and experience; such impact would be higher for aged employees, especially with enhanced experience (Venkatesh et al., 2003; Al-Qeisi, 2009).

3.6.5 The Unified Theory of Acceptance and Use of Technology criticism

The UTAUT is criticised for fraudulently using the TAM theory by designing a unified model that could not describe the real difference with TAM in processes of individual technology acceptance model (Dwivedi et al., 2011). The UTAU designed from eight models and theories; it is complicated for women's SMEs in Kigali. The next section discusses the stakeholder theory.

3.7 Stakehorder theory

The theory of stakeholders originated from the management theory. This theory started during the Great Depression of the United States (1929-1941) when the General Electric Company identified four main stakeholder categories: shareholders, workers, consumers, and the general public (Mishra, A. & Mishra, D. 2013). Erasmus et al. (2015) added the government as a stakeholder. This is because the government

institutions are responsible for setting the businesses rules and regulation guiding the business operation. Freeman's (1984) entrepreneurship perspective extended stakeholders as government, competitors, customers, employees, civil society, supplies, and shareholders as the survival of the business relies on effective collaboration between, the entrepreneurs and the stakeholders.

3.7.1 Stakeholder Theories in information and communication technology

Ahn and Skudlark (1997) defined a stakeholder as: "the stakeholders are a group of people sharing a pool of values that define what the desirable features of an information system are and how they should be obtained". From Ahn and Skudlark perspective, Women-owned SMEs in Kigali need collaboration with the stakeholder to adopt the technology (Internet and cellphone). These stakeholders, including government, telecommunication companies, RCWE, PSF, among others.

3.7.2 Application of Stakeholder Theory in information communication Technology

Boddy and Buschanan (1986) define firm organisational information system stakeholders as "all those who have a practical concern for the effective application of new technologies, and who are in a position to make or influence decisions about why and how they are used". Messabia and Elbekkali, (2010) argue that adopting technology into business concern with the entrepreneurs based on the benefit the new technology will bring to the business. However, with the government and stakeholders' technology adoption, entrepreneurs have to adopt technology to enable running a business even if they do not intend to adopt it - for instance, the registration of business and paying taxes done online in Rwanda. Therefore, women entrepreneurs in Rwanda have to adopt technology to able to comply with government regulations.

Sjöström & Goldkuhlm (2010) ague that an organisation needs change; ICT is the strategical weapon to make a change in the organisation. However, the management should support the change and deal with the resistance. The adoption of technology must take into consideration the stakeholder. This because the technology will be used to interact with the stakeholder. The question the firm ask here is that "what the technology does organisation need to adopt? The answer is that real technology

facilitates the firm to accomplish it is a mission, meet the firm expectation and the stakeholders. Therefore, women-owned SMEs in Kigali should think of stakeholder to adopt technology.

Table 3.1 summarises the ICT adoption theories discussed above in terms of theory/framework, author, advantage, disadvantage, and approach.

Table 3.1 Review of Technology Adoption Frameworks

Theory/ Framework	Author	Advantage /Disadvantage	Approach
Technology Acceptance Model (TAM)	Davis, 1989 Venkatesh et al., 2003	**Advantage** **-** TAM is excellent to explain attitude toward using ICT **-** TAM predicts the intention of use and ICT quite well **-** TAM is easier to use and less expensive to apply **-** Useful for individual **-** A parsimonious and influential model **Disadvantage** **-** Uncertain heuristic value **-** Limited explanatory and predictive power **-** Triviality, and lack of any practical value **-** Useless for organisation	• Perceived usefulness • Perceived ease-of-use
Technology-Organization-Environment (TOE)	Tornatzky et al., 1990 Thatcher & Perrewe, 2002 Kumalo, 2018	**Advantage** **-** Generic: Adoption ICT + Environment **-** Competitive advantage **-** Position large businesses **Disadvantage** **-** Expensive **-** Relevant skills - Not reliable for individual and small businesses	• Technology • Organisation dynamic • Environment
Diffusion of Innovation Theory (DOI)	Rogers, 1962 Giesler, 2012 Ayong & Naidoo, 2019	**Advantage** **-** Competitive advantage for SMEs **-** communicability **-** Performance **-** social approval **Disadvantage** **-** difficult to quantify **-** innovation bias **-** One-way information flow from vender to buyer **-** Difficult to adopt	• Compatibility • Complexity, • Triability • Observability • Relative advantage • Innovation attributes • Innovators' characteristics
Actor-Network Theory (ANT)	Callon & Latour, 1981 Marres, 2004 Eze, 2013	**Advantage** **-** Suitable for social and politic - Descriptive **Disadvantage** **-** not explanatory **-** Complexity	• human (social) on the network • no-human (technical) as actors on the network

		- Amorality - logical, not scientific	
A unified theory of acceptance and use of technology (UTAUT)	Venkatesh et al., 2003 Al-Qeisi, 2009 Dwivedi et al., 2019	**Advantage** - Affordable - Social influence - Trust **Disadvantage** - Poor problem solving compared to TAM - Impractical for understanding organisational technology adoption - Threat - Risk	• Performance expectancy • Effort expectancy • Social influence • Facilitating conditions • Behaviour intention

3.8 Proposed contributions of this study over existing theories

This study's proposed outcome is a model that can be implemented to strengthen individual and organisation business. The motive behind it is that many women-owned SMEs in Kigali are solo entrepreneurs, and few run small and medium businesses. Therefore, it is essential to propose a standard model for them (Rwanda. NISR, 2018).

The TAM based on Perceived usefulness (PU), Perceived ease-of-use (PEOU) constructs stimulated by the attitude to adopt ICT, and UTAUT strengthen TAM with variables such as gender, age, experience and voluntariness of use were efficacy on individual ICT adoption (Venkatesh et al., 2003; Al-Qeisi, 2009; Ajibade, 2018). These models focus solely on consumer acceptance and do not acknowledge whether the current technology is preferable to the alternative, or the related costs and systemic factors influencing the adoption of the various technology options (Lunceford, 2009).

TAM does not take into account the individual characteristics that influence BI in the adoption of new ICT. Therefore, it can be asserted that the assessment of behaviour is challenging since the traits inspire unknown behaviour. As a result, the new technological user does not instantly focus their adoption and capacity on using advanced technologies on their expectations (Zahid et al., 2013).

Despite the UTAUT model extracted from height theories and models as highlighted before, it does not show a notable difference with TAM regarding ICT individual adoption (Dwivedi et al., 2011). The DOI created new technology adoption with a slogan that all innovation technology is right and must be adopted. However, it did not consider an alternative of updating the existing technology which could impact positively on individual or organisational performance (Rogers, 2003). Baker (2012) criticised other theories for their narrow approaches; they did not take a holistic approach to integrating business environment in ICT adoption.

Erasmus et al. (2015) describe the business environment as an internal or external force influencing the success or failure of the business. These are micro-environment, market environment, and macro-environment. The micro-environment refers to an internal business organisation such as management and resources that entrepreneurs can control. Any decision made in micro-environment influence market environment.

Market environment deals with those who are outside the business; they can influence the industry in many ways including through consumers, competitors, intermediaries and suppliers. Market environment determines the strength and weakness of a business. The management cannot regulate the market environment, and paradoxical management can set a strategy to influence the constituents of the market environment - the macro-environment, including government regulation, demography, as well as technology. Macro-environment is beyond entrepreneurs' control; it can constitute advantages or threats for their SMEs. Therefore, ICT adoption enhances the market share, competitiveness, growth and sustainability (Erasmus et al., 2015).

Despite the market environment context, the TOE is acknowledged as being an integrative framework that provides a holistic theoretical basis, even though ICT adoption/diffusion research typically evaluates different technologies, organisation and environmental factors which make adoption/diffusion easier or inhibiting. TOE framework was used to explain the adoption of different types of innovation. Even though there is criticism and limitation of ICT adaptation theories, they strongly impact on individual and organisational adoption of ICT (Jeyaraj et al., 2006; Ramdani, 2013). Recent studies revealed challenges facing women-owned businesses in Kigali. These including stiff competition, limited physical mobility, networking, lack of market, and inadequate access to e-government among others (Mukamana et al., 2017; Nsengimana et al., 2017; Rwirahira, 2018; Rwirahira, 2018; WB, 2019).

After analysing the constraints fronting women-owned SMEs in Kigali and the ICT adoption models and theories, the researcher finds that TOE is a suitable ICT adoption model among women-owned SMEs in Kigali. Due to its quality to take into consideration the organisation and environment and what happens on the market environment, it is an appropriate model for women-owned SMEs in Kigali and elsewhere in developing countries. It could uses to improve their performance, market share, competitiveness and sustainability. To do so, the researcher will design an integrated model that contained elements of the TOE.

The model will be useful for solo entrepreneurs and SMEs, particularly for women entrepreneurs as it duplicates from the constraints they face in the business environment as well those associated with stereotypical and patriarchal behaviours. Kelley et al. (2017) reported that women in many economies, particularly developing

countries face similar constraints in doing business. Therefore, the model will not be limited to women-owned SMEs in Kigali, instead will apply to other developing countries to improve their efficiency, effectiveness, and performance, keys driver to business growth and sustainability. The model will further add knowledge in the area of ICT and women-owned businesses. Despite the criticisms of TOE of being sophisticated, expensive, and perhaps suitable for large businesses, it is the one which could position their businesses; access to e-government, and shift from travelling to use ICT in various activities related to business. Women-owned SMEs in Kigali will balance risk to integrate the model in their enterprises (Thong, 1999; Imre, 2017). The TOE framework has also been used in similar quantitative research (Ramdani, 2013; Kumalo, 2018; Setyaningsih & Kemal, 2019; Mohanty, 2019; Abed, 2020).

Table 3.2 summarises recent studies on ICT adoption undertaken at various reputable universities.

Table 3.2 Summary of recent studies on ICT adoption

Reference	Title	Institution	Summary of work and findings	Evaluation/ Critique
Mutunga, 2019	Strategic Adoption of Information Communication Technology (ICT) and Performance of Small and Medium Enterprises in Nairobi County, Kenya	University of Nairobi: School of Business. Master of Business Administration	The study sought to determine the influence of the strategic adoption of ICT on the performance of SMEs in Nairobi, Kenya. It underpinned OST, DCT, and quantitative method. ICT has furnished top administration with dynamic execution reports, which they can use to anticipate future improvement courses. ICT has helped enterprises in the investigation territory in picking, engineering and decision making.	Open Systems Theory (OST) propose that SMEs should be productive and flexible to internal and external factors that influence performance. Dynamic Capabilities Theory (DCT) contends that enterprises with a more extensive scope of element abilities will outperform and beat enterprises with fewer element capacities. Many scholars have argued that the dynamic capability theory is vague and tautological. While the theory remains helpful when addressing how to respond to the business changing environment, it may fail to describe exactly how.
Kumalo, 2018	The role of cloud computing in addressing small, medium enterprise challenges in South Africa	University of South Africa Promoter: Doctorate in Business Leadership	TOE associated with the mixed method to search how ICT could overcome challenges facing South Africa SMEs. The study developed the Cloud Adoption Framework, which is the anchor of all SMEs challenges.	Integrating Business Challenges to TOE and Cloud Computing synthesised.

Ming, 2016	E-business adoption among SMEs in China: A Study of the Perceptions of SMEs in Hunan Province	University of Central Lancashire, China Master's Thesis	The significance of SMEs for China's economy has received increasing attention over the last decade. Diffusion of Innovation theory associated with the mixed method has the highest potential to provide a useful framework for explaining the unique phenomenon. Quantitative findings suggested that the model can be applied to study e-business adoption issues among SMEs in China and elsewhere in the world. Qualitative findings suggested further study to explore the role of e-Business in businesses.	The conceptual model treats each element individually, with perceived characteristics, communication factors and social factors all being related to a firm's e-business adoption issues. The empirical evidence from this study confirms that the DOI theory applies to e-business adoption issues for SMEs in China. DOI was criticised for being complicated to use for less-educated entrepreneurs.
Okundaye, 2016	Adoption of Information and Communication Technology in Nigerian Small - to Medium-Size Enterprises	Walden University College of Management and Technology USA Doctorate thesis	A Qualitative multiple case study underpins TAM to explore how SME leaders in Lagos, Nigeria, adopted ICT. Organisational leaders adopt and use ICT to achieve significant growth by becoming more efficient, effective, innovative, and globally competitive. Most significantly, SME leaders use ICT to compete at the same level as their larger counterparts	TAM has shown the power to decrease the ICT gap in SMEs considerably. It improved entrepreneurs' business performance.

Eze, 2013	Understanding Dynamic Process of Emerging ICT Adoption in UK Service SMEs: An Actor-Network Approach	Business and Management Research Institute University of Bedfordshire' UK Doctorate thesis	The research aims to advance the understanding of emerging ICT adoptions in SMEs from a dynamic process perspective. The research adopts a social-technical approach that challenges the ideas of mainstream thinkers. It adopts the Actor-Network Theory (ANT) and qualitative method. Adoption ICT in SMEs is unpredictable, dynamic, and an on-going and reiterative process. Monitoring and legislation are the most recurring roles at each stage. Ease of use, managerial time, shared support, customer focus, and adoption costs are the factors affecting the success of multiple stages.	ANT conceptual framework may be useful to researchers in tracing both the expectation of emerging ICT change as well as experiences of technology change. It can help the researcher to understand how those actors can positively influence the adoption over time. It provides a lens for articulating, analysing and understanding the roles and factors affecting emerging ICT at various stages of the adoption process. Researchers should be aware that it is problematic to claim or link the method of analysis employed by ANT to a larger organisational analysis. One of the criticisms of ANT is the claim that it treats both humans and non-humans (technology) as members of actor networks.

3.9 Summary of this chapter

Few studies have addressed the importance of ICT among women-owned SMEs in developing countries. The aim of the research is therefore, to expand the body of knowledge on women entrepreneurship by adoption of ICT to overcome constraints they face in doing business. The proposed outcome of this study is an integrated model for ICT adoption underpinned by TOE that can be implemented to strengthen individual and organisational businesses. Many women-owned SMEs in Kigali are solo entrepreneurs, and few of them run small and medium businesses. It is essential to propose a standard model for them. The model also can be used in developing countries. It suggests that the adoption of ICT among women entrepreneurs will improve their performance, competitiveness that could lead to sustained business growth.

The next chapter discusses the research design and methodology used to carry out this research.

CHAPTER FOUR
RESEARCH METHODOLOGY

4.1 Introduction

The previous chapter focussed on the models and theories underpinning the adoption of ICT among entrepreneurs. This chapter describes the research design and methodology that is used in this study. Positivism philosophy underpins the study; a quantitative survey method was used to collect cross-sectional data from 409 women-owned SMEs in Kigali. The sample population was selected purposively. Validity and reliability is also discussed in this chapter. The data analysis package used was the Statistical Package for the Social Sciences (SPSS) latest version (26spss) and Stata 16. The design of the model is described, and finally ethical consideration guidelines for the research is addressed. The next section discusses the research design.

4.2 Research design

Research design refers to the structure of the research; it is the blueprint of a study; it outlines parts of the research from the beginning to the end. These parts include research philosophy; approach; methodology; data collection; survey; validity and reliability of methodology, instrument, and findings; research instrument, actual data collection, data analysis, and ethical consideration (Cooper & Schindler, 2008). Each part of the research design is discussed in this chapter. Mouton (2001) adds that the research design seeks the best practice philosophy and methodology to investigate the research problem addressed.

Cooper and Schindler (2008) state that the research question is the foundation of research design to plan activities, resources and techniques to gather the type of information needed to answer the research question, while meeting the research objective. Therefore, this study would answer the main research question “What is the impact of integration and use of information and communication technology in women-owned small and medium enterprises (SMEs) in Kigali, Rwanda?" and its sub-questions.

Babbie (2010) argues that any methodology can be used in one way or another to conduct a research study. However, it is the responsibility of the researcher to adopt the most relevant design, which can provide the best quality information, cost-effective, and timely. Therefore, the quantitative design was an appropriate method do guide this study. The framework of this study presents the inter-relationship of the main components of research design, as shown in Figure 4.1. Thus, positivism philosophy underpins this study. It used deductive approach reasoning, which believed that science is only one way to gain knowledge on the importance of ICT in women-owned businesses in Kigali, Rwanda. Therefore, women-owned SMEs in Kigali hold the truth that can be investigated and found. The quantitative method was used to investigate the truth by collecting cross-sectional data. Kigali, Rwanda was selected as the site of research where the population of women-owned businesses run their enterprises. A questionnaire to collect data. However, the questionnaire must be valid and reliable to collected data. Data was analysed using SPSS and Stata statistics Software. The valid and reliable findings obtained and reported. According to (Mouton, 2001) the research design focusses on findings, and when the findings are valid, reliable and practical, it means that the researcher used appropriate methods and techniques to carry out the study. The next section discusses the research philosophy.

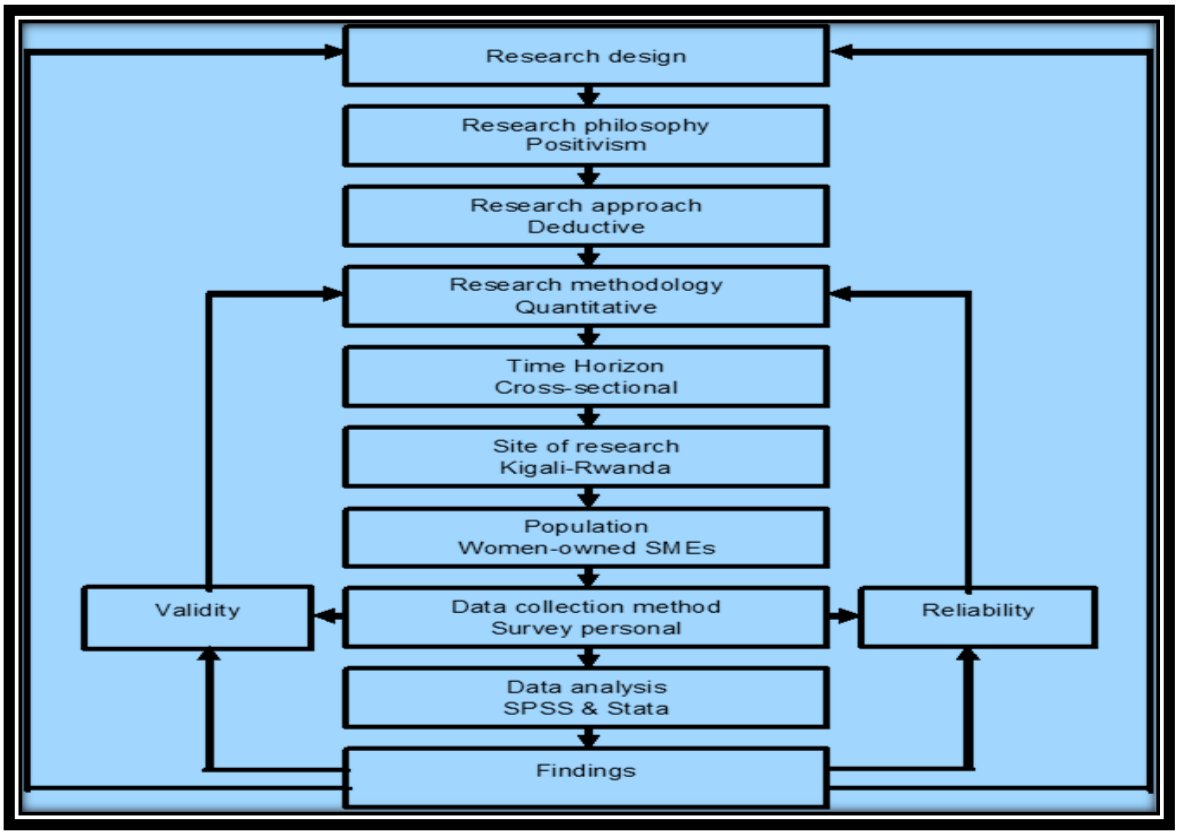

Figure 4.1: Relationship between key elements of the research design (Researcher, 2019)

4.3 Research philosophy

Research philosophy concerns the knowledge of inquiry and how the researcher is going to obtain knowledge on the importance of ICT in women-owned businesses in Kigali (Creswell, 2003). According to Mouton (2001) and Creswell (2003), a research philosophy involves four questions to investigate a phenomenon, and those questions constitute research design. Table 4.1 explains the four questions, which was used to investigate the importance of ICT in women-owned business in Kigali, Rwanda. These questions are what epistemology is; what is the appropriate philosophy to use; what is a methodology and, what is a method? Epistemology is concerned with the existing body of knowledge on the importance of ICT in women businesses in Kigali and elsewhere in the world. The philosophy is about researcher reasoning to gain knowledge on the importance of ICT in women-owned businesses in Kigali. The methodology guides the research process and the method deals with the instrument used to gather data.

Table 4.1: Research philosophy questions

Question	Description
What is epistemology?	Epistemology is about what is already known on the importance of ICT in women-owned businesses in Kigali, Rwanda, a phenomenon under investigation. However, the scholar should not be limited to Kigali, but rather be broad and give an insight into what happens in other countries.
What is the appropriate philosophy to use?	There are three philosophies mostly used in social and business research - positivism, interpretivism, and critical theory.
What is the methodology?	The philosophy determines the methodology to carry out the research; it can be a quantitative, qualitative or mixed approach.
What is the method?	Data collection instrument.

Source: Creswell (2003)

The next section describes the research philosophies used to conduct a research study such as positivism, interpretivism and critical theory.

4.3.1 Positivism philosophy

Positivism believes in the existence of the truth outside society. That truth must be searched scientifically and found (Mill, 2005). To find the truth on enquiry, positivists believe that the investigation of the phenomenon must be conducted in a manner in which the results can be verified statistically or experimentally (Avramidis, 1999).

The investigation of a phenomenon in social and business sciences, for instance, in this study, should collect quantitative information from women-owned SMEs in Kigali, Rwanda (the sample population) and analysed statistically and generalised to women entrepreneurs in Kigali. This is the way to measure the amplitude of a problem faced by a particular society or a group of people with common goals (Mill, 2005).

Positivism philosophy tends to identify the relationship and correlations of facts by comparing various variables. In doing so, the researcher can identify the cause that influences the problem. Positivists believe that successful research underpins positivism philosophy; the results reach the final goal of positivism, which is a law of human behaviour (Trueman, 2019).

However, Thompson (2015) criticises the positivism philosophy in ignoring how society views the world and how people interact. It also ignores the feelings, culture and norms of society. The society should not be subject to quantify statistically. Hughes (2003) introduced the interpretivism philosophy discussed in the following section.

4.3.2 Interpretivism philosophy

While Positivism believes the truth being outside, Interpretivism philosophy views the world differently to Positivism. This is why it is also called anti-positivism. Hughes (2003) argues that interpretivism is an appropriate philosophy to conduct social research due to its quality to understanding and connect the researcher with the sample population. Eriksson and Kovalainen (2016) believe that the reality is inside the society, group or individual and that reality is shared between the society and group. Interpretivism philosophy uses qualitative methodology to collect data. But, it is challenging to interpret qualitative data due to its complexity and uniqueness to obtain the real meaning of the motives and thought behind responses from the participants

(Macionis & Gerber, 2011). The law of human nature should be interpreted. It is crucial to hear how women-owned businesses in Kigali, Rwanda (sample population) perceive the importance of ICT in their businesses. Giving them the opportunities to talk while observing their gestures, feelings and emotions, and then interpret them according to what the researcher heard and observed. Geuss (1981) and Horkheimer (2002) argued that neither positivism nor interpretivism philosophy fits social research. They proposed a critical theory. The following section highlights the critical theory of philosophy.

4.3.3 Critical theory philosophy

The critical theory concerns the status quo change to improve social welfare. This change involves the application of norms, values, beliefs and principles to facilitate the decision-making that moves the society forward (Littlejohn, 1992). The critical theory combines positivism and interpretivism and believes that it is critical to understand the situation people experience in a real context. Studies in the social patterns reveal the hidden formation. Based on knowledge, critical theory shows how people can get out of bad situations. It seeks to join theory and action (Crossman, 2019).

From a critical theory perspective, the importance of ICT in women-owned businesses in Kigali, Rwanda underpins positivism through quantitative methodology using a survey questionnaire. Women who own businesses in Kigali, Rwanda should also be heard to understand their perceptions and feelings towards the importance of ICT in their businesses. To do so, interpretivism philosophy requires collecting qualitative data from a sample population of women-owned businesses in Kigali, Rwanda throughout the interview.

The critical theory will analyse quantitative and qualitative data and bring them together to constitute knowledge on the importance of ICT in women-owned businesses in Kigali, Rwanda. After discussing the philosophies (positivism, interpretivism, and critical theory), the researcher chose to follow the positivism philosophy approach to conduct the study. The next section reveals the motivation behind the choice of positivism philosophy.

4.3.4 Choice of positivism philosophy underpinning the study

This study used positivism philosophy because the researcher believes that reality exists in the world and that reality must be investigated and discovered scientifically. The researcher aimed to gain knowledge and find the truth scientifically on the importance of ICT in women-owned businesses in Kigali, Rwanda (Creswell, 2003; Greener, 2008). Trueman (2019) adds that the gathering of objective facts can reveal human beings' behaviour in a statistical form about what is observed, heard and experienced in the society under study. Therefore, repeating observations and experiments lead to the validity and reliability of results that can be generalised to women-owned SMEs in Kigali. Positivism reasoning based on science involves quantitative method to accomplish its mission. Trueman (2019) states that positivism philosophy has the power to analyse quantitative data and test hypothesis to show the correlation and relationship between variables. Its causal philosophy enables the researcher to determine which variable causes another one to take place. The next section highlights the research approach taken in this study.

4.4 Research approach

Research approach refers to how a researcher reasons about the importance of ICT in women-owned businesses in Kigali. There are three research approaches, and these are deductive, inductive, and hypothetico-deductive. These approaches are described below.

4.4.1 Deductive approach

The deductive research approach is the most used in scientific, social and business sciences. It connects with positivism philosophy in reasoning about the importance of ICT in women-owned businesses in Kigali, a phenomenon under investigation (Walliman, 2011). We learn from them, and we arrived at the point to make conclusions that generalised all those we went through. Deductive emphasises that observation must be repeated many times and done for a large sample population which shares the same characteristics and so that the results can be replicated to the whole population (Dudovskiy, 2019). The next section introduces the inductive research approach.

4.4.2 Inductive approach

An inductive approach is interpretivism reasoning. It uses a qualitative method in research. Its reasoning relies on a general statement that argues logically to reach a particular conclusion (Walliman, 2011; Bradford, 2017). Inductive reasoning on a phenomenon is generated from the existed theory. This theory is tested through observations to find out whether it responds to the phenomenon being investigated. Inductive reasoning was criticised for being manipulated for the observations to meet with the general statement that can make the wrong decision (Walliman, 2011; Dudovskiy, 2019). The following section describes the hypothetico-deductive approach.

4.4.3 Hypothetico-deductive approach

The hypothetico-deductive approach guides critical theory philosophy reasoning; it uses mixed methods to guide the research process. It combines both the deductive and the inductive reasoning views of the world. It combines observation, experience, theory and the hypothesis statement, which is being tested. It believes that a single approach (deductive or inductive) is incomplete reasoning to investigate a phenomenon and provide complete information that influences decision-making (Walliman, 2011). However, Positivists accused hypothetico-deductive reasoning of speculation and breaking the rules of nature. It ignores the reality of knowledge and how knowledge is obtained and underestimates the principles of generalisation (Walliman, 2011). Positivists support deductive reasoning, which is discussed below.

4.4.4 Reason for choosing the deductive approach

In this study, the researcher used deductive reasoning because the study underpinned positivism philosophy, which used deductive reasoning (Dudovskiy, 2019). The researcher observed and experienced women marginalisation toward entrepreneurship in Kigali. This is the reason why women businesses are small in size in comparison with men-owned businesses. The researcher believes that integration of ICT in their businesses could improve their performance, productivity and growth.
The researcher wanted to collect data from a sample population of women-owned businesses in Kigali toward the importance of ICT in women-owned businesses in

Kigali, and the results were generalised to all women entrepreneurs in Kigali. Therefore, generalisation has deductive characteristics. Also, validity and reliability are deductive reasoning. According to Chand (2019), economists and businesses use the deductive approach due to its quality to collect numerical data, which is analysed statistically and is reliable, valid and generalised to the whole population. The next section discusses the research methodology.

4.5 Research methodology

The research methodology is the process, which involves methods and techniques used to generate knowledge on the importance of ICT in women-owned businesses in Kigali, a concern under investigation. The research methodology indicates appropriate methods and techniques to conduct the research design through data collection and analysis (Creswell & Creswell, 2017). Williams (2007) and Creswell and Creswell (2017) identified three research methodologies used to conduct a study. These are quantitative, qualitative and mixed methodology, and they discussed below.

4.5.1 Quantitative methodology

Quantitative design guides the study process. Quantitative methodology is objective, describes, forecasts and clarifies the value, the degree and correlation. The results obtained from the sample population is generalised to the target population (Maree, 2007; Plooy, 2009). Quantitative methodology collects numerical data that is analysed statistically. The results are shown statistically to which extent the problems under investigation quantify their degree, the causal and relationship between the variables. The results orient the management in decision making to solve or anticipate the problems and perhaps revitalise the strategy. Quantitative results must be reliable, meaning that consistency is imperative, which is critical for the management to make a sustainable decision for women businesses in Kigali. The instrument used to collect data must measure what it is dedicated to measuring (Burns & Burns, 2008).

The literature review is the backbone of quantitative study as it helps to gain previous knowledge on the importance of ICT in women-owned businesses. The literature review can be compared with present results to identify the evolution or regression of phenomenon (Creswell, 2003; Greener, 2008). Creswell and Creswell (2017) argue

that quantitative method verifies and challenges the existing scholarship. It cited the hypothesis based on the literature review on the importance of ICT in women-owned SMEs in Kigali. The hypothesis tested through the current results that can support existing findings or reject it.

Quantitative results in some cases are used to develop a framework, which shows the real problem. The framework demonstrates what must be done and how to do things. Implementation of the framework must improve the current situation of women's SMEs in Kigali and other developing countries, and drive their business to sustainability. Despite the quantitative approach solving problems, it also has a negative site. Therefore, the advantages and disadvantages of the quantitative methodology is discussed below.

4.5.1.1 Quantitative methodology advantage and limitation

Any research methodology has its strengths and weaknesses. This section summarises the advantages and disadvantages of using a quantitative methodology.

Advantage of quantitative method

The quantitative method has the power to gather a large number of data quickly through a survey questionnaire or experiments in a limited time. It is cost-effective and faster compared to qualitative and mixed methods (Ayres, 2019). The quantitative method provides the same probability to the population to contribute to the survey, and the results are generalised to the targeted population (Nani, 2011; Ayres, 2019). The results of quantitative research are reliable and valid, which means that other researchers can use the same data collection tools for the same sample population at a different time and obtain the same results (Nani, 2011; Ayres, 2019). The quantitative method it does not capture the name of respondents during data collection that makes them free of fear to provide real information on the inquiry because no one can know which particular questionnaire and which information belongs to whom (Nani, 2011; Ayres, 2019). The next sections will consider the disadvantage of the quantitative method for this research.

Limitation of the quantitative approach

Despite the advantages of the quantitative method discussed above, it also has limitations. As it gathers cross-sectional data, it lacks follow up responses and feedback possibility (Ayres, 2019). It means that there is no possibility to go back in Kigali to give women-owned businesses surveyed, feedback. The sample population selected randomly does not promise to meet the characteristics of the population. There is a possibility to draw the wrong relationship between the variable due to the data collected randomly.

Therefore, the result should generalise to those who contribute to data collection, not to the total population (Ayres, 2019). Quantitative method authenticity was questionable due to relating to the positivism philosophy. The researcher believes that the truth is outside and should be searched from outside. From this belief, positivists considers the data collected through a survey or experiment to be correct, but it is difficult to verify the truthfulness of every single data collected (Ayres, 2019). The next section introduces the qualitative methodology.

4.5.2 Qualitative methodology

The qualitative methodology seeks to provide a better understanding of the importance of ICT in women-owned businesses in Kigali. It is inductive, subjective and interpretive (Greener, 2008). Brynard et al. (2014) argued that the qualitative method engages the researcher directly with the respondents; he hears their words; observes their gestures and perception. Thus, in this study, the researcher may obtain real reality from women-owned business in Kigali, Rwanda relating to integration of ICT and what it may bring to their businesses.

Eriksson and Kovalainen (2015) stated that a qualitative approach is an appropriate method to collect data when a researcher needs to understand deep issues and interprets the current situation in the social and business sciences. The researcher believes that talking, hearing, and observing surveyed participants during the interview provide a deeper knowledge of the importance of ICT in women-owned businesses in Kigali. Maree (2007) and Plooy (2009) criticised the nature of the qualitative method in that it does not discover the knowledge and truth concerning the reality in society;

instead, it constructs. Therefore, it is impossible to verify scientifically; they are not reliable and valid; in contrast, they shape trustworthiness and credibility. Consequently, qualitative results cannot be generalised to the total population. The following section emphasises the mixed method.

4.5.3 Mixed methodology

The mixed methodology combines both quantitative and qualitative approach in a single study (Greener, 2008). According to Denscombe (2007), mixed methods shape three particular features, such as combining both quantitative and qualitative in one research; triangulation, and pragmatism. Creswell and Creswell (2017) argued that mixed-methods follows the research process of data collection and analysis of each method (quantitative and qualitative). The data analysis, results and conclusions must have an insight into other information the researcher obtained from the analysis of quantitative and qualitative data. This helps the researcher to draw neutral conclusions and fit the data into research problems and questions. The mixed approach breaks down the limitation of quantitative and qualitative approaches. The next section describes the motive behind selecting a quantitative method to guide this study.

4.5.4 Reason for choosing a quantitative methodology to guide the research

The researcher selected the quantitative method over qualitative and mixed methods because the construct of this study underpins positivism philosophy associated with deductive reasoning approach. The type of study uses a quantitative method to carry out the research study. The tripartite of the quantitative method, positivism philosophy and deductive approach believes that science is an appropriate way (objective) to find the knowledge and truth and understanding of the opinions and attitudes of women-owned business in Kigali on the importance of ICT in their businesses (Greener, 2008). Cooper and Schindler (2008) observed that many business managers champion quantitative research due to its quality to present the results statistically as they can analyse the results and make sustainable long-term business decisions.

The quantitative method delivers approximate figures and can be trusted to establish a correlation between concepts (Bryman, 2012). The quantitative method, through its quality, to collect large data from women-owned business in Kigali may provide reliable

and valid results, enabling them to be generalised to all women running businesses in Kigali. Implementation of conclusions and recommendations can improve the efficiency, effectiveness and competitiveness of their SMEs. Curwen et al. (2013) advised managers in businesses to conduct a quantitative study to solve the problem their organisations face or anticipate the challenges to their organisation. Considering the above reasons, the researcher concurs that the quantitative method is the most suitable one to be used in this study. This method was also used by Huye and Sikoska (2003); Mariam et al. (2013) in similar studies. The next section emphasises the time horizons.

4.6 Time horizons

There are two categories of time horizons, cross-sectional and longitudinal. The researcher has to choose one for his or her study (UKEssays, 2018). Saunders et al. (2009) stated that the time horizon differs from other components of the research process due to its independence. There is no influence of method or technique to the time horizon. A cross-sectional study is conducted for a specific time, area and sample population; it is a once-off survey that is generalised to the whole population. It is also known to be cost-effective. It provides current descriptive and explanation of results on the phenomenon under study, and it does not predict the future. Therefore, there is no follow up strategy (Cherry, 2019).

A longitudinal study, contrary to a cross-sectional study, extends in time and provides a large picture of a problem. The researcher can conduct a survey in different times and sequences for months even for many years, for instance, in the case of epidemiology. A longitudinal study can follow up with the evolution of inquiry under investigation. It can also provide feedback to the target population (Dagnino & Cinici, 2016; Cherry, 2019).

The researcher selected the cross-sectional study over a longitudinal one because the nature of the study does not require one to conduct a longitudinal study, preferably a cross-sectional one which is done once off. According to Mathers et al. (2007), Surveys conducted at just one point in time are known as cross-sections in design. They are giving a snapshot of what is going on in that group at that particular time. Cross-sectional studies are often conducted in the business field. A cross-section survey

provides descriptive and explanatory data on the phenomenon. Cross-section design has been a common design to evaluate business performance and growth. It shapes power to test hypothesis, answer research questions, and the researcher can make assumptions. The researcher can also look into the financial side and evaluate its affordability and time effectiveness compared to a longitudinal survey (Chen, 2019). The next section describes the data collection.

4.7 Data collection

Data collection is a process of gathering information from the population (Abawi, 2013). Waters (1994) emphasised the importance of quantitative data as a raw material containing facts, opinions and measurement, presented in numbers to provide valuable information. Curwen et al. (2013) stated that data collected guides management to make the right decisions. This is because good quality data collection is needed to investigate the real problem under investigation. Good quality data influence managers to make the right decisions. In contrast, "bad quality data" leads to the wrong decision making, which could result in the bankruptcy of the business. Therefore, the business should benefit from data instead of being harmed by it.

The process of data collection includes a discussion on how, where and why the researcher choose Kigali as the site of research; the selection of population; the sampling method and why the researcher chooses the purposive technique. It further includes how the researcher determined the sample size; the design of the survey questionnaire, the parameters for a successful instrument and the survey instrument is clarified. The pilot study, administrated questionnaire, planning before the field data collection, and field data collection has been illustrated. The next section describes the site of study.

4.8 Study area and justification

The researcher selected Kigali, Rwanda as a research site. The study was conducted in Rwanda, a central, eastern African country; a landlocked area with an area 26 338 square kilometres. Four countries border Rwanda in northern Uganda, South Burundi, East with Tanzania, and West with the Democratic Republic of Congo (Figure 4.2). Figure 4.2 shows the localisation of Rwanda a political map of African countries (United

States of America. CIA, 2019). Kigali, the site of study is located almost in the centre of the country, and is the political and economic capital of Rwanda (see Figure 4.3). Figure 4.3 indicates the localisation of Kigali on Rwanda geo provinces map. It contains three districts: Gasabo in the North; Nyarugenge central business district (CBD) in the Southeast; and Kicukiro in the South-West (see Figure 4.4).

Figure 4.4 shows the districts of Kigali City. The total population of Kigali is 1 132 686, including 546 563 (42%) women (NISR, 2014). Kigali is the largest economic city in Rwanda. Headquarters of banks are located in Kigali and there are many hotels, most tourists stay in Kigali when they visit Rwanda. Most manufacturing and wholesale companies are located in Kigali. The international airport is also situated in Kigali (Tafirenyika, 2016).

Kigali was chosen as the site of study because it is where many women run SMEs and their businesses vary in different industries, opposite to rural businesses which are mostly related to agriculture. In Kigali, ICT infrastructures are established compared to rural areas (United States of America. USAID, 2015; Sesonga, 2016). Women-owned SMEs in Kigali and economic and administrative cities may be interested in this study as it seeks to improve their businesses efficiency through the leverage of ICT. The researcher chose a portion of the population to contribute to the study. The next section discusses how the researcher selected the sample population.

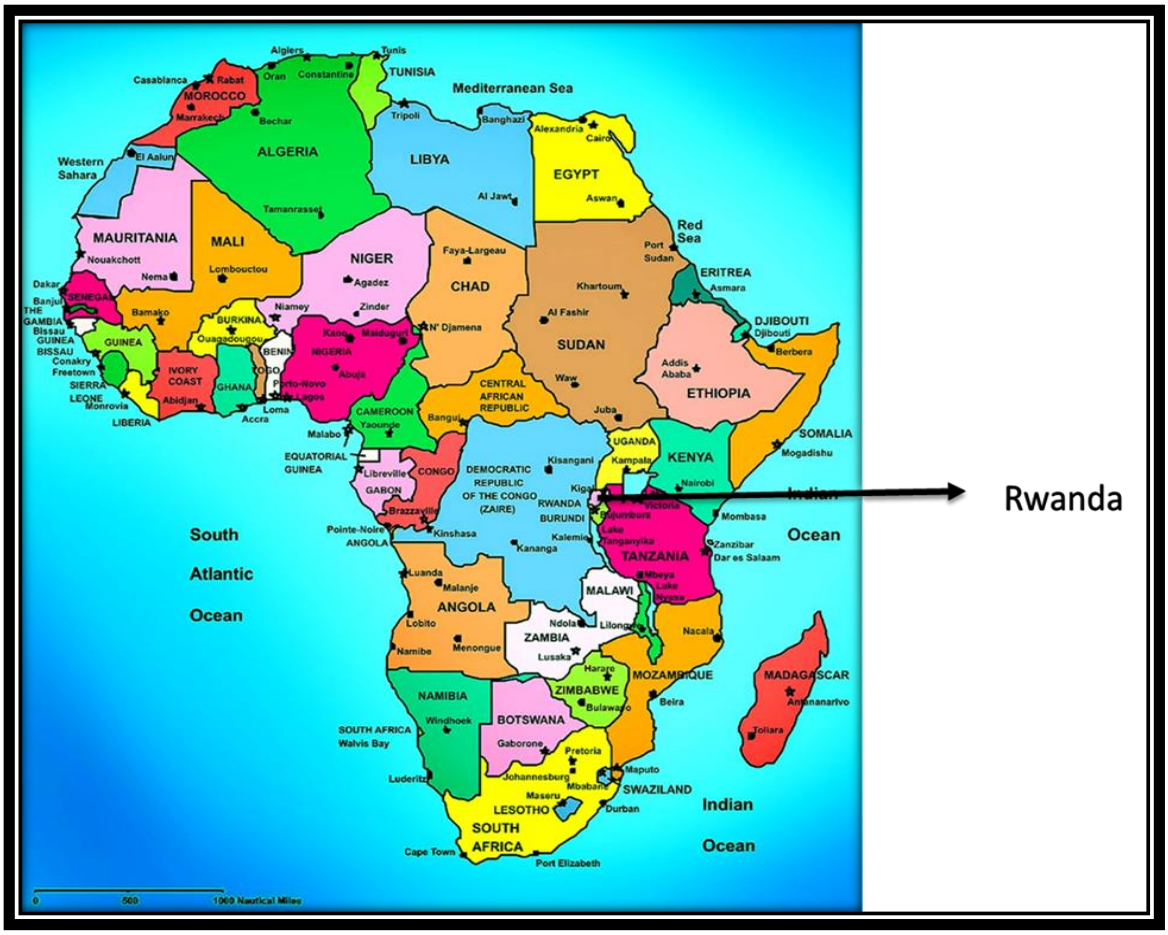

Figure 4.2: Political map of African countries (adapted from Admin, 2015)

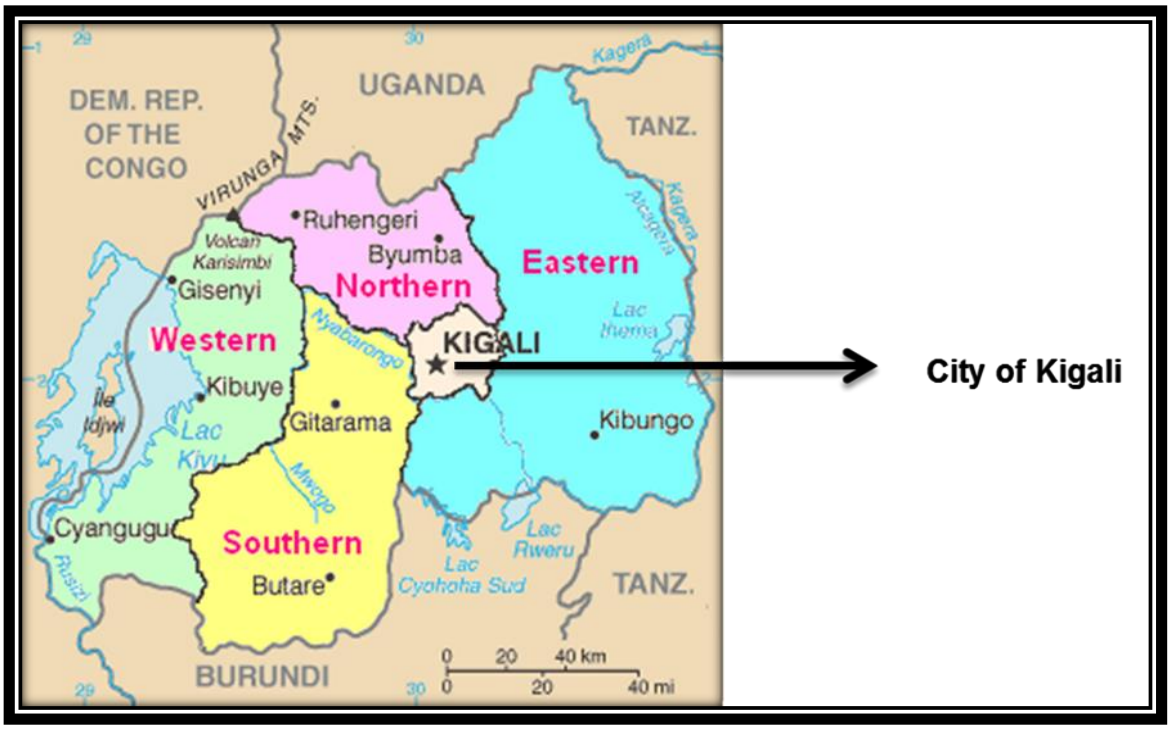

Figure 4.3: Rwanda Geo Provinces (adapted from Wikimedia Commons, 2010)

Figure 4.4: Map of the city of Kigali (Enjoy Rwanda, 2011)

4.9 Population study

A population in this study is an ensemble of women-owned SMEs in Kigali. Women-owned SMEs in Kigali may benefit from the study as it can solve a problem that they face which may encourage them to contribute to the research study by providing credible information (Curwen et al., 2013; Jensen & Laurie, 2016). The target population was women-owned businesses in three districts of Kigali (Gasabo, Kicukiro, and Nyarugenge). The literature reviewed indicated that women businesses in developed and developing economies are small in size compared to their male counterparts (International Labour Office, 2015).

The researcher chose women owner-businesses in Kigali because they face many constraints (Rukundo, 2015; Mbabazi, 2018; Rwirahira 2018; Nsengimana et al., 2019). The researcher believed that the women might find the study interesting because of the leverage ICT could bring to their businesses and provide solutions to the challenges they are facing (UN, 2014; Goswami & Dutta, 2015; OECD, 2018). The study has the potential to improve their performance that leads to business growth.

This will prompt the women to provide quality information during the data collection process. The criteria to contribute to the study is discussed below.

4.9.1 Eligibility criteria to participate in the study

All women entrepreneurs in Kigali were not legible to contribute to the survey. The following criteria describes those who participated in the survey:

- Females
- 18 years of age and older
- Rwandan citizen and foreign nationals
- Speaking Kinyarwanda or English
- Business must be one month old and older
- Business must be SMEs
- Business must be located in the city of Kigali (Gasabo, Kicukiro, and Nyarugenge District)
- Business must be in the importation, exportation, wholesale, retail, ICT, manufacturing, transport, agriculture, construction and service sectors.

4.9.2 Uncovered population in research

- Informal businesses
- Females under 18 years old
- Other languages out of Kinyarwanda and English
- Men’s businesses
- Large businesses
- Business located out of Kigali city

Section 4.9.3 describes the sample population used in this study.

4.9.3 Sample population

The sample population was a subset of female-owned SMEs in Kigali, selected to contribute to the survey. They represented all women-owned SMEs in Kigali. It is not

possible for every women-owned SMEs in Kigali to contribute to the study because of a large number of them, time and financial constraints (Jensen & Laurie, 2016). Therefore, a sample population of women-owned SMEs in Kigali was selected to contribute to the survey study. Their size will be discussed in the sample size section. The next section reveals the sampling technique.

4.10 Sampling methods

The sampling method refers to the technique the researcher applied to select a sample of women-owned SMEs in Kigali to contribute to the survey. The objective of sampling was to obtain reliable findings using a proportion of women-owned SMEs in Kigali (Kumar, 2011). There are three sampling methods, and these are the probability sampling, non-probability sampling, and the non-rule sampling method. Probability sampling is where everyone in the population has the same probability of participating in the data collection. The non-probability sampling (purposive sampling), the researcher selects the population sample according to his will, judgment, purpose, and projection. The non-rule sampling method does not have regulations regarding the sample selection (Barreiro & Albandoz, 2001; Curwen et al., 2013). The researcher used a purposive sampling method, as detailed below.

4.10.1 Purposive sampling

Purposive sampling is the opposite of probability sampling. It does not give everyone in population the same chance to participate in data gathering; instead, the researcher makes its judgment (Curwen et al., 2013). This study used purposive method to select women-owned SMEs in Kigali to participate in the survey. The researcher used this method in line with Curwen et al. (2013) and Dudovskiy (2019) who stated that in purposive sampling, the researcher takes his or her decision to pick a sample population. The sample population selected by the judgmental sampling method could provide reliable information because the choice of the researcher is aimed at the right people directly linked to the phenomenon under investigation. The purposive method was most reliable to reach women-owned SMEs in Kigali where they run businesses; and it delivers high quality of information, free or little error, and bias (Marchall, 1996; Denscombe, 2007). At this stage, the number of the sample population is unknown. Thus, the following section discusses the sample population size.

4.11 Sample size

Barreiro and Albandoz (2001) and Creswell and Creswell (2017) stated that sample size is a small number of people selected from the total population to participate in the survey. Figure 4.5 shows the total population (women-owned SMEs in Kigali). However, the sample population are those who are in the black circle which means that a portion of the population contributed to the survey. Therefore, the results was generalised to the entire women-owned SMEs in Kigali. The suitable selection of representative number positively influences the validity and reliability of findings and research as a whole (Barreiro & Albandoz, 2001). However, the sample size depends on whether the number of population is known or unknown. This is because the sample size is calculated from the population. Therefore, when the number of population is unknown another alternative used to find the sample size as discussed in the next paragraph (Phrasisombath, 2009).

IFC (2008); Stevenson and St-Onge (2011) and Rwanda. NISR (2018) reported that the number of women-owned business in Kigali is unknown. However, Rwanda. NISR (2018) established a census to identify the total number of enterprises in the country, however, it did not provide a specific number of female enterprises in the provinces and the city of Kigali. Therefore, the number of businesses the statistics pointed out was the total number of sole proprietor enterprises 174 113 (100%); Enterprises-owned by males 117 254 (67%), and enterprises-owned by females 56 859 (33%) (See Table 2.2).

Based on the absence of women enterprises statistics in Kigali, the researcher adopted an online calculator to determine the sample size. Hightower and Scott (2012) recommend Raosoft sample size calculator to determine the sample size in a research survey because of its high confidence, minimum error, and high distribution of response. The Raosoft sample size calculator helps to determine the sample size; it estimates the population of 20 000; credibility of 95%, error of 5% may occur. The response of 50% always reflects as high. These estimations are demonstrated below.

4.11.1 Estimated population

Due to an unknown number of women-owned SMEs in Kigali, the population is estimated at 20 000 (Raosoft, 2004; Hightower & Scott 2012; Rant, 2013). Referring to the total number 56 859 (See Table 2.2) of women enterprises in Rwanda, the estimated population of 20 000 women-owned businesses in Kigali is a great number and large population (Rwanda. NISR, 2018). The credibility of Raosoft, sample size calculator is discussed below.

4.11.2 Credibility

Using a large number of a population of 20 000 increases the number of confidence while decreases error that may occur during data collection. Using 20 000 population to determine sample population means that the responses the sample population gave had potential credibility of 95%. If asked the same question to women-owned businesses in Kigali and if repeated many times and 95% of answers stayed the same, there was credibility of 95% (Raosoft, 2004; Hightower & Scott 2012; Rant, 2013).

4.11.3 Margin of error

Using a large number in calculating the sample population minimises the percentage of error that may occur in the response of respondents. 10% error could be tolerated, but on the Raosoft sample size calculator, the margin of error is 5% when sample population is calculated on the population of 20 000 (Raosoft, 2004; Hightower & Scott 2012; Rant, 2013).

4.11.4 Response distribution

As the researcher does not know the number of the population of the women-owned SMEs in Kigali, Raosoft software recommends 50% distribution of response, which provides the biggest sample size (Raosoft, 2004; Hightower & Scott 2012; Rant, 2013). The Raosoft sample size calculator used these variables (population 20 000; credibility 95%; margin error 5%, and response distribution 50%) to determine the sample size of 377 women-owned businesses in Kigali to contribute in the survey questionnaire.

The formula below was used to calculate the sample size of 377 (Raosoft, 2004; Hightower & Scott 2012; Rant, 2013).

$$n = \frac{N}{1 + \left[-\frac{N\left(\frac{L}{100}\right)^2}{1.96^2\, P(1-P)} \right]}$$

$$n = \frac{20000}{1 + \left[\frac{(20000)\left(\frac{5}{100}\right)^2}{1.96^2 (0 \cdot 5)(0 \cdot 5)} \right]}$$

$$= \frac{20000}{1 + \left[\frac{50}{0 \cdot 96}\right]}$$

$$= \frac{20000}{1 + [52.083]}$$

$$= \frac{20000}{53.083}$$

n = 376.768 ≈ 377 (sample size)

N = Estimated total number of women-owned businesses in Kigali, Rwanda (20 000)

L = Margin tolerated error is 5%

P = Expected proportion of Women-owned SMEs view the importance of ICT in women-owned businesses to integrate ICT in their SMEs (in this case, 0.5, used as subsequently there is no other prior research conducted on this inquiry leading to the assumption that there is a 50-50 probability that women-owned businesses in Kigali.)

n = sample size?

Denscombe (2007) concluded that a large sample size presents less error and increases the validity and reliability of results. However, the sample size considered a minimum population to contribute to the survey. Whether possible, the researcher might go over 377-sample size. Therefore, the researcher collected 409 questionnaires; the details if the advantages will be provided during the actual data

collection section later in the chapter. The next section describes the survey methods implemented in this study.

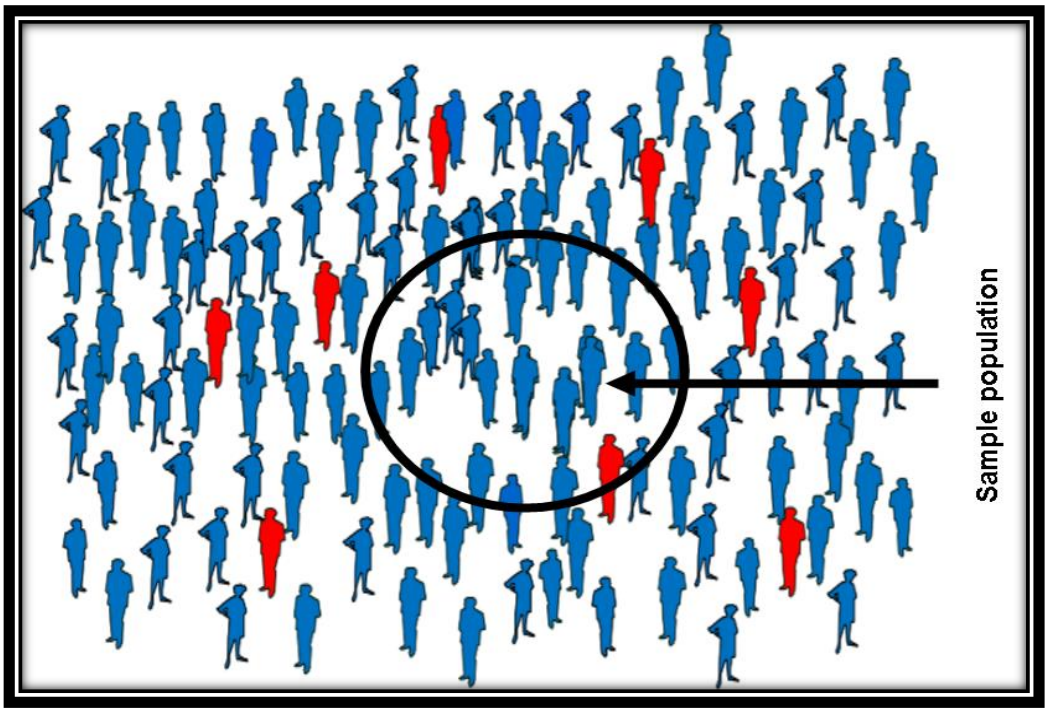

Figure 4.5: Sample population (Researcher, 2019)

4.12 Survey method

A survey is an aggregate data collecting method used to collect, analyse, and interpret the opinion, attitude, and perception of the sample population. One of the strengths of the survey is the collection of a large number of data from a primary source (Mckee, 2015; Sincero, 2019). However, to ensure that the objective of the study is attained, the research instrument must be appropriate, valid and reliable. These are very important due to the survey method principles of generalising the result of the sample population to the whole population (Cooper & Schindler, 2008; Sincero, 2019). SurveyMethods (2017) and Sincero (2019) observed the benefits and downside of a survey, as discussed below.

4.12.1 Benefits of survey

The survey collects a large number of data. It argues that a great number of data is gathered from the sample, analysed and generalised to entire population to provide results closer to the reality of the population than other methods (SurveyMethods, 2017; Sincero, 2019). The survey is considered as cheaper compared with other techniques of data collection, for instance, focus group interviews (SurveyMethods, 2017; Sincero, 2019).

The survey can be used various ways to collect data, including a post office, Internet, email, telephone and an online survey. Because of gathering a large number of data, the results obtained contain rich information on the phenomenon under investigation, more than other methods. Finally, the survey provides valid and reliable results that generalised to the whole population (SurveyMethods, 2017; Sincero, 2019). Despite the benefits of the survey, there are also downsides which is discusses in the next section.

4.12.2 Downsides of survey

The survey method is criticised for being inflexible**.** When a questionnaire is sent to the respondent to complete, there is no way to ask the researcher for clarification on questions they may not understand. This is contrary to focus groups or face-to-face interviews where participants are free to ask the researcher for explanation or clarity on ambiguous questions. Most of the time, questions in the survey are standardised and applied to different groups or societies which have different traits, characteristics and cultural backgrounds (SurveyMethods, 2017; Sincero, 2019). The next section highlights the survey methods for gathering data.

4.12.3 Data gathering methods

There are various techniques to collect survey data. These including self-administered surveys, telephone surveys, group-administered surveys and personal surveys. These methods are debated below.

4.12.3.1 Self-administered surveys

In self-administered surveys, the researcher sends a questionnaire to the respondents via mail, fax, courier, and hand to hand. The respondents complete the questionnaire themselves, and they return them to the researcher using the same channel which they received from the researcher. The researcher goes back to collect the questionnaires after they have been completed by respondents (Cooper & Schindler, 2008). With the development of ICT, self-administered surveys are conducted using the Internet. These are called computer-assisted self-administered. It has become popular, the researcher sends a questionnaire via the Internet and respondents complete and submit responses immediately (Cooper & Schindler, 2008).

A self-administered questionnaire was criticised for discriminating illiterates from contributing to the survey (Curwen et al. (2013). However, self-administered surveys are less costly and can reach large populations in vast territories. The return rate of the questionnaire may be low, may have incorrect answers and some answers may be answered (Polonsky & Waller, 2011). The telephone survey is another survey method and is discussed below.

4.12.3.2 Telephone surveys

During the telephone surveys, the researcher asks the questions directly to the respondents through phone calls. It is the quickest method of delivering the responses immediately and cost-effectively as compared to face-to-face interviews. The other advantage is that the calls do not have a territory limit. But, telephone surveys, most of the time, is short and impersonal, which may cause more bias because there is no anonymity (Maree, 2007; Polonsky & Waller, 2011). The following section introduces group-administered surveys.

4.12.3.3 Group-administered surveys

In this method of survey, the researcher meets with a group of people in the same venue, and each sample population completes the questionnaire at the same time and returns it to the researcher. In a group-administered survey, the researcher is in the field, respondents have the opportunity to ask him questions and receive responses.

The benefits of this method are that, it is an affordable method and the researcher can reach respondents in an isolated area, and it provides good quality of optimal data. However, the downside, includes the sample population, selected purposively not randomly, and may not resemble the real representative sample (Maree, 2007; Plooy, 2009). Like face-to-face in the group-administered survey, the personal survey is also conducted face to face. This method is explained in the next section.

4.12.3.4 Personal surveys

Personal surveys have been endorsed by many statisticians, academia and managers to be the best survey method that provides a higher quality of data (Keller, 2009; Plooy, 2009). In personal surveys, the researcher reaches the respondents wherever they are. The researcher conducts interviews face to face with respondents. He or she can observe the attitude, emotions, gestures and perception of respondents towards the questions asked. Respondents have the opportunity to ask the researcher for clarity on questions they do not understand. Sometimes respondents go beyond the interview to ask about the impact of the research on them (Keller, 2009; Plooy, 2009).

The personal survey has a high rate of correct answers and lower biases compared to other methods. But, it is an expensive method because the researcher must travel to reach every respondent at her business location. The personal survey can use a structured questionnaire where the researcher asks and records a response. In addition, with the development of ICT, the researcher can also use an ICT device like a tablet, smart cell phone, and laptop. The personal survey gives the researcher the opportunity to record answers and take photographs (Cooper & Schindler, 2008; Polonsky & Waller, 2011).

The researcher used a personal survey structured questionnaire method using a technology Computer-Assisted Personal Interviewing (CAPI) method to collect 377 data from a sample population of women-owned SMEs in Kigali. However, 409 questionnaires were collected. This will be discussed below when exploring advantages during the actual data collection section. The researcher believes that it was the best method to gather the data to reach women entrepreneurs at their businesses.

Cooper and Schindler (2008) and Keller (2009) stated that personnel surveys are the best survey method to collect high quality data. This was the motivation that inspired the researcher to choose the personal survey as a method of data collection from women-owned businesses in Kigali, despite the higher travelling cost. The illiterate women-owned business had the opportunity to be part of the sample population and contributed to the survey. Conducting the personal survey interview, the researcher adopted a CAPI method where the questionnaire was online on a Google form.

Google Forms is a cloud-based data management platform used to design and create questionnaires based on the Internet. Google Inc10 provides this software. Moreover, it is openly available online to anyone using and creating web-based questionnaires. Everywhere-anytime-access and other benefits including unlimited surveys, absolutely free, statistics, automatically saving data on Google sheet and drive have made Google Forms a popular Internet survey research tool (Vasantha & Harinarayana, 2016; Kishore & Lokesha, 2016).

These were the reasons the researcher had chosen to use a Google form survey to collect data from women-owned businesses in Kigali: It was easy to collect data. It was also cost-effective as the research site was in Kigali, Rwanda, and the researcher resides in South Africa. Collecting data using Google form avoided paper work and transport of questionnaires from Rwanda to Cape Town of South Africa, which would be costly and time-consuming. The survey was also easy to analyse using SPSS. Every respondent who completed the questionnaire submitted it automatically on Google driver and saved it, resulting in a high rate of true response.

It shows the individual questionnaire and analyses data automatically during the course of data collection. The researcher is a registered student in the Business and Information Administration Department, and his thesis is "the importance of ICT in women-owned businesses in Kigali, Rwanda". The researcher endeavoured to match the research and the data collection method using ICT (tablet and Internet) to collect data. The researcher believed that collecting data using technology might stimulate women-owned business to answer correctly. However, the survey method needs an appropriate data collection instrument, which will be discussed in the next section.

4.12.4 Data collection instrument

A personal survey structured questionnaire interview was used to gather data from women-owned businesses in Kigali (see Appendix A). Abawi (2013) stated that data collection instrument is a tool a researcher utilises to collect data from the respondents; it must be accurate to provide validity and reliability results. Figure 4.6 explains that a personal survey questionnaire used to collect data from women sample population in Kigali was valid and reliable. Furthermore, the results obtained were also valid and reliable that replicated all women running SMEs in Kigali.

An appropriate data collection instrument influences the quality of results (Brynard et al., 2014). Maree (2007) stated that questionnaire design is the most critical part of the research process. A good questionnaire design collects high-quality data that provide reliable results that drive to the right decision making. Mouton (2001) and Williams (2007) reported that most quantitative research in social and business sciences involves a large number of respondents using survey questionnaire to gather data.

Jensen and Laurie (2016), Plooy (2009) and Keller (2009) observed that the personal survey is the most suitable technique to gather data from a public place and business and the researcher reaches sample population where they are. The researcher used a personal survey method to collect data from women-owned SMEs in Kigali for the following motives: The researcher expected to collect a large number 377, but 409 were collected from women-owned SMEs in Kigali at their business location in the districts of the city of Kigali. The questionnaire was close-ended questions used computer-assisted personal interviewing to collect data.

In line with Cooper and Schindler (2008) and Keller (2009) the researcher believed that computer-assisted personal interviewing collects high-quality answers with low or no biases. This data collection method keeps respondents anonymous, and it provides an opportunity for illiterates to contribute to the survey because they do not need to write answers, the researcher asks and records their answers. In agreement with Vasantha and Harinarayana (2016) the researcher used computer-assisted personal interviewing using google forms because after every questionnaire completed and submitted using the Internet, the data was saved automatically on the drive and google

sheet. There was no need to collect the questionnaire as it happens in a self-administered survey. The next section discusses the questionnaire design.

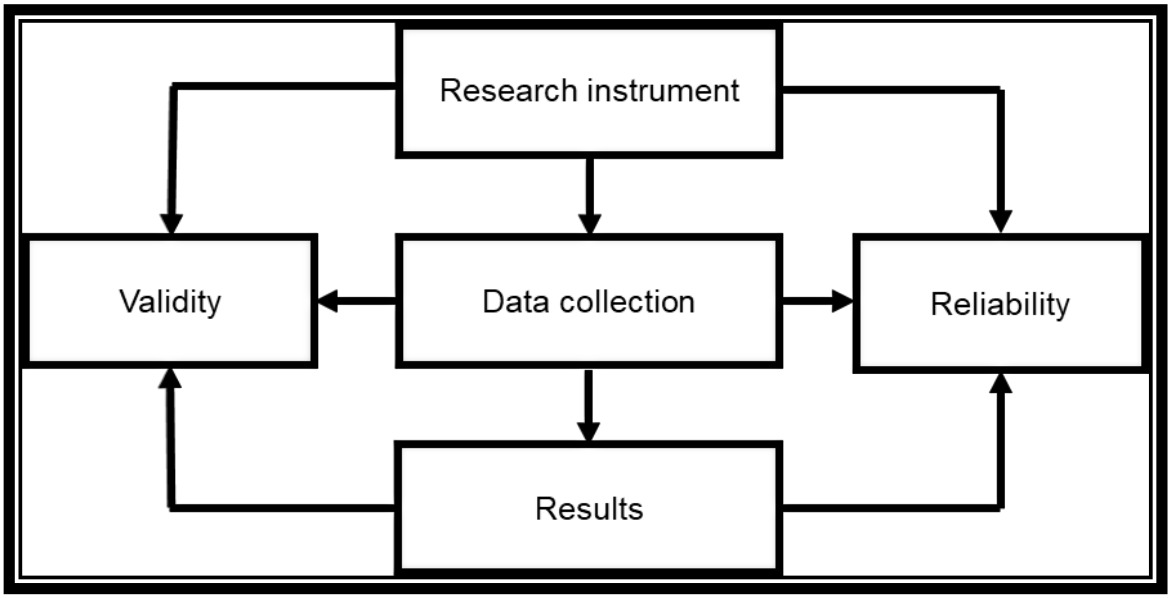

Figure 4.6: Good survey instrument (Researcher, 2018)

4.12.4.1 Questionnaire design

According to Maree (2007) and Istanbul (2015) a questionnaire is a list of questions or any other items able to gather data that can be analysed and provides information on an inquiry under investigation. Walliman (2011) reported that the questionnaire collects primary and experimental data, and it can be associated with observation to gather data on the field of research. In this study, the researcher expected to gather 377, but 409 primary data was gathered directly from a sample population of women-owned SMEs in Kigali.

The researcher consulted questionnaires of previous studies relating to the current topic. This consultation helped the researcher to compose a relevant, accurate, useful, and comprehensive research questionnaire. It is also possible for the researcher to adjust the questionnaire or use the existing one, but the researcher must reference the author (Jensen and Laurie, 2016). The researcher composed the questionnaire after consulting with reputable organisations and researchers who share similarities with his topic (Naicker, 2010; Nani, 2011; UNCTAD; 2014; Nsengimana, 2017). The researcher also consulted the CPUT statistician who helped to adjust the questionnaire to meet the criteria of validity and reliability to enable the analysis statistically, using SPSS. The

researcher submitted the questionnaire to the supervisor who made some changes to strengthen it. Finally, the researcher submitted the questionnaire to the Faculty of Business and Management Sciences, Faculty Research Ethics Committee (FREC) for approval. It was approved and guaranteed a clearance certificate No | 2019FOBREC687 (See Appendix F). Despite the process undertaken to compose the questionnaire, the next section discusses the categories of data questionnaire gathered.

4.12.4.2 Type of data contained in a questionnaire

The questionnaire collected different categories of data such as nominal, ordinal, interval and ratio. Data survey included raw material that was transformed into information through data analysis (Creswel, 2014; Ali & Bhaskar, 2016). The design of the questionnaire contained nominal, ordinal and interval data. Nominal data refers to the number of the category. For instance, if you are married, please indicate your marital status. The categories are married, separated, divorced, and widowed (Plooy, 2009; Ali & Bhaskar, 2016). Ordinal data consists of the questions which were in order. The respondents are given a structured question in order and are asked to rank the statement or question, for example, five-point Likert scale strongly disagree 1; strongly agree 5.

Interval data is that which shows a value between two or more variables. For instance, how much capital did you use to start your business? RwF 300 000 – 10 000 000, RwF 11 000 000 – 20 000 000. However, ordinal data was used for majority of questions. Maree (2007) reported that quantitative survey research, ordinal data are most used; for instance, the Likert scale is mostly used to measure the degree of attitude, opinion, and feelings of respondents. Therefore, different Likert scale was used to collect data from women-owned businesses in Kigali, for example, five points Likert scale, the lower rate was strong disagree =1, disagree =2, neutral =3, agree =4 and the higher rate was strong agree =5. The next section describes the type of questions contained in the questionnaire.

4.12.4.3 Type of question

A questionnaire encloses many questions with different styles of questioning. Sandie (2016) stated that closed-ended and open-ended questions are broad types of questions used to collect quantitative and qualitative data. The data collected affects the results, conclusions, recommendations and most importantly, the decisions. The open-ended and closed-end questions are discussed below.

Open-ended questions

According to Creswel (2014), open-ended questions often collect qualitative data through the interview and are grouped, coded and interpreted by the meaning words. Participants can respond in their own words, express their feelings and perceptions, and a weak questionnaire can stimulate responses. It can also bring unpredicted ideas into the study. The open-ended question is used when a researcher needs to measure participants' behaviour.

Close-ended questions

Closed-ended questions are structured questions in the form of multiple-choice. Respondents select answers among the options given. Likert scale is the most popular used in closed-ended questions. The closed-ended questions offer an option to the respondents to write the answers, which may not be listed among the given options (Burgess, 2001; Harlacher, 2016). Plooy (2009), states that a quantitative survey applies closed-ended questions to collect numerical data that is analysed statistically to provide information.

Acharya (2010) agreed that closed-ended questions are cost-effective and less time consuming; they gather good quality of data compared to open-ended questions. Data can be easily analysed statistically using statistics software; for instance, SPSS. Results are valid and reliable and generalised to the entire population. Despite the advantages of closed-ended questions, the researcher selected closed-ended questions instead of open-ended questions. The next sections point out the language used to collect data.

4.12.5 Questionnaire language

Sandie (2016) stated that it is compulsory to draw a survey questionnaire in the language of respondents. It increases the confidence of respondents; a collaboration between researcher and respondents; quality of data gathered; the validity of the questionnaire, and most importantly avoids bias. However, the institution involved in data collection may use an international language, for instance, English and French. Therefore, the researcher composed a questionnaire in English, as it is CPUT's official teaching and learning language. He translated it into the respondents' language Kinyarwanda, the language most women who own SMEs in Kigali, Rwanda speak and write. English is the second official language used in Rwanda after Kinyarwanda. Every single question had two versions, English and Kinyarwanda and was in different colours for easy visualisation of the difference. Data was collected from women-owned businesses in Kigali in their native Kinyarwanda language. The next section shows the content of the questionnaire.

4.12.6 Questionnaire and variables contained

The variables contained in the questionnaire is presented according to the questionnaire sections (see Appendix A). Table 4.2 summarises the content of the questionnaire and the variables investigated. Each variable is discussed below.

Table 4.2 Components of questionnaire and variables investigated

Section	Variables investigated and test hypothesis
Section one	Socio-demographic information
Section two	Business Knowledge/Skills
Section three	Business Profile
Section four: Reasons for starting a business	- To identify the socio-economic factors influencing women in Kigali, Rwanda to join entrepreneurship. - H_1: There is a positive relationship between motivation and new women enterprise creation in Kigali, Rwanda.
Section five: Constraints facing women-owned small and medium enterprises in Kigali, Rwanda	- To identify the constraints experienced by women entrepreneurs in doing SMEs in Kigali, Rwanda.

	- H_2: There is a negative relationship between the constraints faced by women-owned businesses in Kigali, Rwanda and the management of small-sized enterprises.
Section six: The contribution of ICT to improve women businesses and find a solution to constraints they face in doing business in Kigali	- To explore how ICT could intervene to find the solution to constraints facing women entrepreneurs in Kigali, Rwanda. - H_3: There is a negative relationship between constraints faced by women-owned business in Kigali, Rwanda and the use of the Internet into women businesses in Kigali, Rwanda to find a solution to those constraints.
Section seven: leadership and stakeholders' role in promoting the use of ICT among women's businesses	- To investigate whether the Rwandan administration and stakeholders, ICT policies support the successful integration and use of ICT in women enterprises in Kigali, Rwanda. - H_4: There is a positive relationship between stakeholders' ICT initiatives and effective integration and use of ICT in women enterprises in Kigali, Rwanda in order to ensure competitiveness of women businesses.

The main objective of this study was to identify the importance of integration of ICTs in women-owned business in Kigali- Rwanda, to enable women to use ICT to grow their businesses, to be more productive, and competitive. The fundamental reason for this study was that the Rwandan society underestimate womens' ability to run and grow businesses. Women businesses are small in size compared to those of men. However, the adoption of ICT can stimulate their businesses growth. The questionnaire survey emphasises socio-demographic information; business knowledge and skills; business profile; reason behind becoming an entrepreneur; business constraints; ICT as part of constraints solution, and the role of stakeholders in promoting ICT among women entrepreneurship in Kigali, Rwanda. The questions were coded and divided into seven sections, as showed in Table 4.2 above. The next section explains section one of the questionnaire.

4.12.6.1 Section One: Socio-demographic information

Demographic information was gathered to obtain identification of respondents and to identify if demography influenced women to penetrate entrepreneurship in Kigali. To gather socio-demographic information, the researcher used dichotomous questions, multiple-choice, fill-in, filter and partially closed questions.

According to Maree (2007) dichotomous are those questions with two option answers including "yes" or "no" which are used among others in this section. He defines multiple-choice as a statement or question with more answer options; respondents can select one or more answers to define her or his character or describe herself while fill-in format was opened to the respondents to fill in, for instance, the age (years) in number. According to Plooy (2009), the filter is a question asked to a particular sub-group of the sample. The respondents who do not relate to those questions do not answer. For instance, questions such as are you married. If "yes", please indicate your marital status in the next question. If "no" skip the following question.

According to Australia. Australian Bureau of Statistics (2018) partially closed questions give an option "other" that respondents can give in their answers if they could not find answers on the list of options provided for that particular question. Section one, socio-demographic information data collected information on the marital status, age, education, nationality, membership of RCWE and their work before entrepreneurship. Questions were coded 1-7 (see Appendix A). The next section introduces business knowledge and skills.

4.12.6.2 Section 2: Business Knowledge/Skills

In this section, the researcher used dichotomous questions, multiple-choice and follow-up questions to collect information investigating the knowledge/skills women-owned SMEs in Kigali had before they started businesses, and the effect of education and training on business. The questions were coded and numbered 8-11(see Appendix A).

4.12.6.3 Section 3: Business Profile

Business profile data was collected and used in the fill-in format, multiple-choice dichotomous, and filter questions. The objective was to gain information on women-owned businesses. The questions included the number of business, legal status, the industry in which business operates, age of business, source of start-up capital and amount, number of workers, turnover, how the business started, registration, preferred consumers, shareholders, the situation of business, achievement and business plan (see Appendix A). This information provided insight on women businesses in Kigali, Rwanda. Questions were coded 12-31. The next section describes the reasons for starting a business.

4.12.6.4 Section 4: Reasons for starting a business

Multiple-choice questions were used to collect motivation and opinion data from women-owned businesses in Kigali. The researcher investigated the reasons that pushed or pulled them toward entrepreneurship and whether they asked husbands or families permission to start businesses. The objective was to answer the first research sub-question “What are the socio-economic factors influencing women in Kigali, Rwanda to join entrepreneurship”. It was also to test the first hypothesis “There is a positive relationship between motivation and new women enterprise creation in Kigali, Rwanda.” According to IBM Corporation (2010), SPSS captures, processes, and analyses variable on attitude, opinion of entrepreneurs. Questions were coded 32 and 33 (see Appendix A).

4.12.6.5 Section 5: Constraints face women-owned SMEs in Kigali, Rwanda

The Likert scale was used to collect data from women-owned SMEs in Kigali. The researcher wanted to measure the level of constraints faced by women-owned SMEs in Kigali and how those constraints affect their businesses. According to Maree (2007) and SmartSurvey (2017) the Likert scale measures how respondents feel, perceive and think about something. The Likert scale assisted the researcher to identify the level of feeling or attitude of respondents, for example, by agreeing or disagreeing with the statement. The researcher-composed statements about the constraints faced by women-owned SMEs in Kigali (see Appendix A). They rated statements or questions

according to their feeling, perception, and opinion on the statement given. A five-point Likert scale was used to collect data strongly disagree = 1, represented the lowest degree of feeling; disagree = 2; neutral = 3; agree = 4; strongly agree = 5. Data was analysed using SPSS; the results identified the level of constraints experienced by women-owned SMEs in Kigali.

The objective of this section was to answer the second sub-research question "What are the constraints experienced by women entrepreneurs in running small and medium businesses in Kigali, Rwanda", and to test the second hypothesis “There is a negative relationship between the constraints faced by women-owned businesses in Kigali, Rwanda and the management of small-sized enterprises”.

The constraints were grouped into five categories, respectively, gender inequality constraints, financial constraints, government constraints, skills constraints, and own fear constraints. Questions were coded 34-59 (see Appendix A).

4.12.6.6 Section 6: The contribution of ICT in improving women businesses and finding a solution to constraints they face in doing business in Kigali

This is the largest part of the questionnaire, it extended from 60 to 150 questions (see Appendix A). This section seeks to find a solution to the previous research question "what are the constraints experienced by women entrepreneurs in running small and medium businesses in Kigali, Rwanda". It also investigated the position of ICT among women-owned businesses in Kigali. Dichotomous, multiple-choice, fill-in, filter, partially closed, and Likert scale questions were used to gather attitudes, opinions, perceptions, and feelings from women-owned SMEs in Kigali toward the contribution of ICT to improve their businesses and find solutions to the constraints they face in doing business in Kigali.

The researcher believed that the analysed attitudes, opinions, perceptions, and feelings variables using SPSS could provide the information relating to the extent ICT can contribute to developing women businesses performance and its role in mitigating or finding solutions to the constraints women-owned SMEs in Kigali experience. The data collected in this part of the questionnaire was expected to answer the third sub-research question "How could ICT intervene to find solutions to constraints facing

women entrepreneurs in doing business in Kigali, Rwanda? Results also test the third hypothesis "There is a negative relationship between constraints faced by women-owned business in Kigali, Rwanda and the use of the Internet into women businesses in Kigali, Rwanda to find a solution of those constraints"'. As mentioned above, the questions were coded from 60 to 150 (see Appendix A). The next part explained the content of the last part of the questionnaire.

4.12.6.7 Section 7: Leadership and stakeholders' role to promote the use of ICT into women's businesses

This is the last part of research questionnaire; it focused on the investigation of the contribution brought by the government of Rwanda and stakeholders to promote ICT among women-owned business in Kigali and whether ICT policies support the successful integration and use of ICT in women enterprises in Kigali, Rwanda**.** Dichotomous, multiple-choice, filter, partially closed, and Likert scale questions were used to collect attitudes, opinions, perceptions, and feelings data from women-owned businesses in Kigali toward the government and stakeholders' efforts and policies to facilitate and promote the integration of ICT among women businesses in Kigali.

The results were expected to answer the fourth sub-question "Does Rwanda administration and stakeholders' ICT policies support the successful integration and use of ICT in small and medium women-owned enterprises in Kigali, Rwanda? It also tests the fourth hypothesis " There is a positive relationship between stakeholders' ICT initiatives and effective integration and use of ICT in women enterprises in Kigali, Rwanda in order to ensure women businesses competitiveness"'. The questions are coded from 151 to 161 (see Appendix A). The questionnaire was tested before administration.

4.12.7 Pilot test

A pilot test is a pre-data collection survey conducted on a small number of the sample population to ensure that the questionnaire is comprehensive, free from error, bias and easy to respond (Walliman, 2011). The researcher conducted a pilot test from 15 women entrepreneurs in Kigali. The pilot test revealed some questions that needed a slight modification in Kinyarwanda for a better understanding. Those questions were

adjusted. The survey used CAPI method to gather data from women-owned SMEs in Kigali. The questionnaire used a Google form survey. The researcher tested the feasibility of using technology as it is not a familiar method in Rwanda. The tablet connected to the Internet was used in the pilot test to gather data from 15 women-owned SMEs in Kigali. The test was positive; all 15 forms from the pilot tests were submitted successfully. Despite respondents involved in data collection using ICT device for the first time, they did not show any negative sign that could affect the process of collecting data. Respondents were familiar with smart telephones, Internet, and social media; therefore, collecting data via the tablet seemed normal for them. The next section looked at the administration of the questionnaire.

4.12.8 Administrating the questionnaire

After conducting a pilot test, the researcher updated the questionnaire that was used to collect data on the field from women-owned SMEs in Kigali, Rwanda sample population. During the pilot test, some questions were identified as unclear and were adjusted. According to Wright (2018), revision of survey questionnaires after the pilot test strengthens the questionnaire, eliminates errors, biases, and improves communication between researcher and respondents. It precisely showed the researcher the data collection work on the field that is being performed and the resources needed to carry out the task. After the researcher obtained the final questionnaire, the researcher also adjusted Google form and retested to ensure that it worked properly. The next section emphasised the preparation of data collection on the field.

4.12.9 Preparation before data collection on the field

The questionnaire was revised; Google form was created and updated. The questionnaire was ready to collect data from a sample population of women-owned SMEs in Kigali, Rwanda. The researcher hired an assistant to help him in data collection. The assistant has strong experience in data collection and contributed as a surveyor in many surveys including the Fourth Population and Housing Census 2012 (Rwanda. NISR, 2014); Rwanda Demographic and Health Survey (The DHS program, 2014); Rwanda violence against children and youth training and survey, 2017; Rwanda demographic and health survey (The DHS program 2018).

In Rwandan culture, women do not freely talk about gender, cultural, corruption and sexual issues with men. These issues were part of the research questionnaire and having a female collect data from women entrepreneurs could be seen as a good move to collect rich data. Respondents may feel confident, comfortable and talk freely when responding. The researcher brought a tablet and an external USB battery to ensure that the tablet worked at least 12 hours. After mobilising resources, the research assistant allocated a day for each district to gather women entrepreneurs and inform them about imminent data collection. Gasabo district was visited on 16th August, Nyarugenge 17th August, and Kicukiro 19th August 2019. The site visit was successful and the women that were visited guaranteed a good collaboration in data collection. The next step was the launch of the actual data collection.

4.12.10 Actual data collection

The final questionnaire was ready and resources available to collect data. Actual data collection followed. Actual data collection refers to the practical action of collecting data on the field (Nani, 2011). Data was collected from a sample population of women-owned SMEs in Kigali at their site of work. Most of the cases were shops. Before, starting to collect data, the researcher drew a data collection action plan (see Table 4.3). Table 4.3 detailed the planned actions undertaken during data collection, including period, districts, and activities. It was planned to collect total of 377 survey forms distributed as 126 surveys for Gasabo; 126 for Nyarugenge and 125 for Kicukiro district of Kigali city. Data collection was planned to take place within 40 working days, with an average of approximately 10 survey forms per day.

The actual data gathering was scheduled to be completed over 40 working days from 20th August to 4th September 2019. The working hours were eight hours per day from 9h00 to 17h00, which made 48 hours per week, Monday to Saturday, Sunday was an off day. The 48 hours per week complied with Rwanda's labour law in its 43rd article Law regulating labour in Rwanda N° 66/2018 of 30/08/2018 (Rwanda, 2018). As showed in Table 4.3, data collection started in Gasabo followed with Nyarugenge (CBD), and finally Kicukiro District. The activities of each district is presented independently starting with Gasabo district.

Table 4.3: Data collection plan

Date	District	Activity
20/08 to 05/09/2019	Gasabo	Collection of 126 survey forms
06/09 to 20/09/2019	Nyarugenge	Collection of 126 survey forms
20/09 to 04/10/2019	Kicukiro	Collection of 125 survey forms
Total 40 working days	**Kigali city**	**Total data collected 377 questionnaires**

4.12.10.1 Data collection in Gasabo district

Data collection started in Gasabo district, and it extended from 20th August to 5th September 2019. Gasabo is located in the North of the city of Kigali. It is the largest district with an area of 430.30 square kilometres and it is home to the presidency, parliament, and many ministry offices. It has many industries such as manufacturing, hotels and entertainment (Rwanda. City of Kigali, 2019; Wikipedia, 2019).

Gasabo was chosen firstly because it is the biggest district. Transport was a challenge to reach the respondent. Public transport was required and walking a long distance to reach respondents. In some instances a taxi motor was hired. Data was collected from various businesses, including retail shops, hardware, restaurants, pubs, lodges, and services. At arriving at the respondents, the researcher assistant introduced herself and explained the reasons for the data collection. She showed respondents the letter from the Chamber of Women Entrepreneurs authorising data collection from them and a letter from CPUT were given to them. They were also informed of their rights during data collection, and guaranteed that the data was for research purposes only.

The survey used a personal survey method, structured questionnaire on Google survey form. Mathers et al. (2007); Keller (2009) and Plooy (2009) state that in the personal survey, the researcher interacts face to face with respondents, asking them questions and recording answers in the questionnaire. Many researchers agreed that the personal survey is the best method to gather quality data. It offers respondents a chance to ask for clarity on questions they do not understand. The structured questionnaire was contained on the Google survey form in the tablet connected to the Internet. Questions were asked and answers recorded on the Google survey form. At

the end of each survey, the questionnaire was submitted and automatically saved on Google drive. Respondents were collaborative, but were apprehensive about questions 18 and 19, respectively, regarding start-up capital and annual income respondents. They were asking how those questions related to the academic study, as they thought perhaps that the RRA was investigating the tax issues. However, after explaining that it was strictly for research purposes, they answered. The time planned for fifteen working days was enough to gather the 126-survey questionnaires. However, 134 survey questionnaires were collected, which were more than the planned amount. After Gasabo, Nyarugenge followed.

4.12.10.2 Data collection in Nyarugenge district

Nyarugenge is a Central Business District (CBD) situated in the central city of Kigali with an area of 134 km^2 (Rwanda. City of Kigali, 2019). Women businesses in Nyarugenge are larger than those of Gasabo, and many are located in the CBD. Respondents' businesses were in retail, wholesale, hardware, construction importation, wholesale, retail, ICT, manufacturing, transport, agriculture and service industry.

Data collection in the CBD was relaxing; public transport was accessible at almost all locations. Only a few trips were done with taxi motor and walking. Access to respondents was easy. Many ran businesses in Nyabugogo bus station, which connects Kigali with other provinces and neighbouring countries, and the city bus station. These two stations are located with supermarkets, markets and many business activities take place. Some respondents share large shops with different sections and products, and all of them were interviewed one after another, which saved time.

However, women whom the husbands were helping to run businesses were not free to answer questions. In some instances they asked their husbands what to say. These were seven cases in Nyarugenge. Five respondents asked for money to give information. It was explained to them that it would be unethical to buy data and they eventually agreed and contributed to the survey. Interestingly, educated respondents understood the reason for data collection.

Those who share shops were encouraged by others to contribute. Eleven educated respondents were interested in the questionnaire and asked if they can have feedback. They believed that the study could help them to improve their businesses and embrace ICT. They were given the name of thesis, author and informed that the thesis would be on the CPUT website www.cput.ac.za, they can check and find it there at the end of 2020.

Nine respondents asked if the project could give them computers. They received further explanations that the purpose was only for students who collected the data for academic research; they could not expect anything beyond giving information; they understood and agreed. Data was also collected in suburbs Gitega, Kimisagara, Muhima, Nyakabanda, Nyamirambo, and Rwezamenyo. This was to ensure that every ward was represented. Gasabo, Nyarugenge was also worried about providing information regarding the capital start-up and annual income; they may underestimate the real amount as they were scared that that was an RRA official, despite the explanations given. The period of thirteen working days was planned for gathering data in Nyarugenge and was sufficient. Interestingly, 141 survey questionnaires were collected, which was 15 more than the 126 survey questionnaires planned. The last district was Kicukiro and is discussed below.

4.12.10.3 Data collection in Kicukiro district

Kicukiro was the last district for data collection. Data was collected during the period of 20/09 to 06/10/2019. It was chosen to be the last one because it is where the researcher assistant stays. She preferred to start far and finish at home. Many of Kicukiro district habitants were born there that differentiated Kicukiro from Gasabo and Nyarugenge were many habitants immigrated from various corners of the country and foreign nations. Women businesses in Kicukiro are small-sized compared to Gasabo and Nyarugenge, and they concentrated mostly in retail. Respondents in Kicukiro were more cooperative than Gasabo and Nyarugenge respondents. After the introduction, they contributed to the survey.

They were not suspicious and provided information freely. The data collection was quick because they did not have more clients and did not have to wait to serve them. However, the weather was not good, rain-interrupted the survey for two days and this pushed the schedule back by two days. The survey was only completed on 6th October

2019. As mentioned before, Sunday was considered a day off, but on the last Sunday, 6th October, the research assistant preferred to work to ensure the data collection was completed. Despite the two days delay, 134 survey questionnaires were gathered instead of 125 that was initially anticipated. The next section emphasises constraints faced during the data gathering.

4.12.10.4 Challenges during actual data collection

During the period of data gathering, some challenges were observed such as poor Internet connection, transport, weather and waiting time. The interruption of the Internet was frequent, which resulted in the restarting of the questionnaire when the Internet resumed. Sometimes the Internet took longer to connect and one would have to wait until it was back. Transport was a challenge, as public transport was not available in all areas that data was to be collected. At times, she would have to walk long distances to reach respondents. She sometimes used the taxi motor that is expensive compared to public transport. The weather was not always ideal, it sometimes rained, which made movement difficult. Activities were stopped for 2 days due to rain. As data was collected during the time the respondents were running their business, when customers were there, she sometimes had to wait until the respondent attended to them. Some respondents preferred not to answer all questionnaires, which they did not feel comfortable with. According to CPUT ethics consideration, during data gathering, respondents are allowed to refrain from answering questions without giving any explanation to the researcher (Maree 2007; Cape Peninsula University of Technology, 2013). The following section highlights the benefit during the field data gathering.

4.12.10.5 Advantages during the actual data collection

In general, respondents were collaborative. Among respondents, some were members of the Guide Association which the research assistant was also a member. The research assistant served on the national board of Rwanda Girls Guide Association, and the familiarity facilitated high quality data collection. Although 377 questionnaires were planned for collection, 409 questionnaires were collected, which was more than the sample population. Raosoft (2004); Hightower and Scott (2012) and Rant (2013) stated that Raosoft sample size calculator given was the minimum of the sample

population and collecting more data compared to the proposed ones, improved validity and reliability of results. The next section describes the data processing.

4.13 Quantitative data coding, capturing and cleaning

Coding is a process that involves summarising large amounts of information into a code to enable statistical analysis (Walliman, 2011). Data capturing refers to recording data from the questionnaire to a spreadsheet in Microsoft excel or creation of a new dataset enabling the usage of a statistical software package, for instance, SPSS. Data cleaning is an action to carefully verify any errors in the data captured (IBM Corporation, 2017). In this study, Google survey forms and coded data is captured automatically on an excel spreadsheet, which is a suitable program to transfer data to SPSS to be analysed. The following section presents the data analysis.

4.14 Data analysis

Data analysis is the action of interpreting large data to offer a short meaningful variable (Brynard et al., 2014). Williams (2007) reported that quantitative data involves numbers and must be analysed statistically to provide information. Figure 4.7 shows the process of analysing data collected from women-owned SMEs in Kigali. Data collected were in numbers considered as raw material (input). It was processed using SPSS and Stata software and generated output (information). The Statistical Package for the Social Sciences (SPSS) 26 latest version was used to analyse descriptive data and test hypothesis. SPSS can analyse complex data in a short time, and it was endorsed for social and business sciences (Arkkelin, 2014). SPSS enables to provide excellent quality of tables, graphs, and pie charts (Landau & Everitt, 2003; Kent State University, 2019). The results measured the attitudes, perceptions, and opinions of women-owned SMEs in Kigali on the importance of ICT in their business. Stata 16 version was used to conduct Bartlett's test for sphericity and calculated the Kaiser-Meyer-Olkin Measure of Sampling Adequacy.

Figure 4.7: Data analysis process (Researcher, 2019)

This section of the study is by no means an interpretation of the findings, but rather an introduction of how various methods of data analysis have been used to analyse data and present findings. Therefore, the details of how the data was analysed will be provided in the next chapter.

4.14.1 Variable analysed

The SPSS and Stata analysed descriptive statistics; Pearson's correlation coefficient; inferential analysis; reliability tests; test for normality; Bartlett's test for sphericity; Kaiser-Meyer-Olkin test, and structural equation modelling. These variables are discussed below. The analysis proceeds through the process of Suhr (2015:200). This discussion follows, starting with descriptive statistics.

4.14.2 Descriptive statistical analysis

Descriptive statistics in quantitative research summarises the large statistics data, and it provides explanation of variables in number, table, and graphics. It has the power to compare the variables (Trochim, 2006). Descriptive statistics contains three main variables, such as distribution, central tendency, and dispersion. Each variable shapes its particular features. In this study, the descriptive statistics are presented in mean, median, mode, standard deviation, frequency tables, histograms, bar diagrams, pie charts and graphs. Also, the normality tests and Shapiro-Wilk test were done to measure the distribution of data. For skewed-left distributions, the mean is less than the median and the median is less than the mode. For skewed-right distributions, the mode is the smallest value, the median is the next largest, and the mean is the largest. The researcher needs a measure of the distribution or spread of data around an expected value. The variance and standard deviation provide such measures. The variance can be thought of as a kind of average of the $\sum (x - \mu)^2$ values. However,

for technical reasons, he divides the sum by the quantity n -1 rather than n. Standard deviation was calculated to determine if the scores on a parametric test are evenly distributed and cluster closely around the mean. Data from frequencies are presented graphically for easy handling and comprehensiveness. The data are portrayed in the form of pie charts, bar graphs and or histograms. These will be detailed in Chapter Five. The next section introduces the Pearson's correlation coefficient.

4.14.3 Pearson's correlation coefficient

This study also formulated hypothesis; it suggested that the test of hypothesis strengthen descriptive statistics results to gain new knowledge on the importance of ICT in women-owned businesses in Kigali and to make reliable decisions and recommendations that could be implemented to improve the adoption and integration of ICT in women's businesses to stimulate efficiency, performance, growth, and sustainability of businesses. The hypothesis is a logical statement formed with dependant and independent variables. The test of hypothesis supports or rejects the statement (Walliman, 2011; Haradhan, 2017).

SPSS analysed correlation statistics and used coefficient to measure the relationship between dependent and independent variables. It determines the extent to which the variables are related to each another. The coefficient range from -1 to +1 (Bryman & Cramer, 2001; StatisticsSolutions, 2019).

To ascertain whether a relationship was statistically significant, that is, whether one can reject the null hypothesis of no relationship, a significant level of 0.05 was used in this study. There are three categories of correlation. Firstly, positive and negative correlation. It occurs when two variables move in a different direction. The one takes a positive direction named positive correlation. Another one progresses to the negative direction named negative correlation. Secondly, linear and non-linear or curvi-linear correlation happen when together dependent and independent variables modify at the same ratio, then it is known as being in linear correlation. The opposite is identified to be in curvi-linear correlation.

Finally, simple, partial and multiple correlations arise when both variables are engaged in the study; thus, it is named simple correlation. However, if one of the variables is a factor, it is valuated as partial correlation. When many variables are valuated for correlation, they are named multiple correlations (Creswell, 2012; StatisticsSolutions, 2019). StatisticsSolutions (2019) identified five degrees of correlation, such as Perfect correlation, a high degree of correlation, Moderate correlation, Low degree of correlation, and Absence of correlation. These degrees are described below.

- Perfect correlation: It happens when two variables modify in the same ratio
- The high degree of correlation: Once the correlation coefficient range is more than 0.75; it is named a high degree of correlation
- Moderate correlation: Correlation coefficient range is between 0.50 to 0.75; it is named in a moderate degree of correlation
- Low degree of correlation: Correlation coefficient range is between 0.25 to 0.50; it is called a low degree of correlation
- Absence of correlation: Correlation coefficient is between 0 to 0.25, it indicates that there is no correlation.

Therefore, in order to determine whether the correlation was statistically significant, that is, whether the null hypothesis of no correlation can be rejected, a significant level of 0.05 was used in this research. The next section introduces the collinearity and outlier detection.

4.14.4 Collinearity and outlier detection

In regression analysis, since independent variables are not correlated, the value of the regression weight stays constant independently of all other predictor variables used in the regression equation. However, whether they are correlated, the value of the regression weight relies on how other variables used in the model. Hence, where independent variables are correlated, the regression coefficient does not necessarily represent the actual relationship between each independent variable on the dependent variable, but instead a partial influence. As a consequence, the approximate regression coefficients can differ significantly from each set of data (Dimitruk et al., 2007).

SPSS measures the oriented leverages between 0 and (n-1)/n, whereby n represents the number of observations. The mean value of this leverage measure is p / n, while p is the number of independent variables. If all the results had an equally equal effect on the expected value of the coefficients, the leverages would be similar to p / n. Observations for which the leverage was higher than 2p / n for this analysis were omitted. Correlation analysis and reliability analysis were conducted to determine the degree and nature of the interaction (positive or negative) and to determine the reliability of the constructs. Normality tests have also been conducted. The next section explains the study of inferential results.

4.14.5 Inferential analysis

Inferential statistics analysis goes beyond the definition of the features of the data and the evaluation of the relationships of variables, to make conclusions by inference based on the data analysed. It is also used to test statistically grounded hypothesis (Walliman, 2011). In this study, inferential statistics were used to test the hypothesis. It involved logistic regression, variables, Structural Equation Modelling (SEM), and T-test, which will be described further in Chapter Five.

4.14.5.1 Reliability Tests

Reliability in statistics is the cumulative accuracy of the measure. Tests have been considered as having high reliability if they yield identical outcomes under predictable conditions. Highly credible results are correct, reproducible and consistent from one test occasion to another. In other words, if other researchers replicate the survey and test process, precisely the same outcomes would be obtained (Kumar, 2011). When a researcher needs to measure the attitude, perception, and opinion of respondents, and he/she has access to statistics software, Cronbach's coefficient alpha is a suitable measure to test reliability. Therefore, SPSS was used to analyse the reliability of results. The alpha coefficient higher than 0.7 were approved (Field, 2009; Plooy, 2009). The next section introduces the test of normality.

4.14.5.2 Test for Normality

In statistics, normality checks are utilised to assess if the set of data is well-modelled by the normal distribution and to measure how probable it is that the random variable representing the data set is normally distributed. Most standardised statistical tests require normality assumptions. Skewness and kurtosis tests are used to evaluate whether or not a variable is naturally distributed. For normality, skewness could be near zero, i.e. between-1 and +1 (George & Mallery, 2010), and Kurtosis could range between-3 and +3 (McNeese, 2016).

4.15 Factor Analysis second data

4.15.1 Exploratory Factor Analysis

The Exploratory Factor Analysis (EFA) test was conducted on all constructs that evaluated it. Confirmatory Factor Analysis (CFA) is used to validate its uni-dimensionality. EFA is conducted to minimize the measurements of items or questions linked to the same problem within a given model to realistic scales (Suhr, 2004).

In this analysis, it was used to examine the factors of each of the constructs, i.e. the constraints faced by women-owned small and medium-sized enterprises, OnLine Access and leadership and the role of stakeholders to encourage the use of ICT in women-owned enterprises or to help leadership and stakeholders (Suhr, 2004; Jelonek, 2013). This was used to test the constructs by determining precisely the definitions can be used to calculate the construct or to determine the real dimensions of the construct. The next segment focuses on the Cronbach Alpha Coefficient.

4.15.1.1 Cronbach Alpha Coefficient

The Cronbach Coefficient (Alpha value) is a common approach to calculating the reliability of the underlying component. The usage of Cronbach Alpha is meant to show the stability or internal continuity of the elements comprising a composition according to the EFA. (Field, 2005). Values vary from 0 to 1.0 with higher values suggesting greater reliability between products. A low alpha value (< 0.7) means that the fundamental factor is not accurate. If a single component increases the reliability of the

factor, it is normal practice to omit it from the factor as a means of enhancing the alpha value of the factor (Hair el al., 1995). The following section points out the role of Bartlett's test for sphericity.

4.15.1.2 Bartlett's test for sphericity

The Bartlett variance homogeneity test is utilised to measure that variances are equal for all samples. It ensures that the presumption of equal variances is valid before other statistical experiments are carried out. It is used because the researcher is reasonably confident that the data originates from a regular distribution (Prins, 2013). Stata's "factor test" command was used to carry out Bartlett's test for sphericity. The Bartlett's test of sphericity tests indicates that the small values less than 0.05 of the significance level, suggests that factor analysis may be useful for your data (Prins, 2013). The next section discusses the Kaiser-Meyer-Olkin test.

4.15.1.3 Kaiser-Meyer-Olkin test

Kaiser-Meyer-Olkin (KMO) Test is a calculation of the suitability of the data for Factor Analysis. The test measures the sampling relevance for each variable in the model and the complete model. The statistic is a measure of the proportion of variance between variables that may be a common variance. The smaller the percentage, the more suitable the data is for Factor Analysis. Stata's "factor test" command was used to perform the KMO of sampling adequacy test, and suggest that high values close to 1.0 commonly show that factor analysis may be suitable with data (Stephanie, 2016). The following section emphasises Confirmatory factor analysis.

4.15.1.4 Confirmatory factor analysis (CFA)

Confirmatory Factor Analysis (CFA) performed to evaluate the capacity of the predefined factor model to match the data collection. CFA was used in this research to validate the dimensions that make up the construct. Confirmatory Factor Analysis (CFA) is a statistical method used to assess the composition of the component in a series in variables observed (Suhr, 2004). This research, CFA, allowed the researcher to test the hypothesis and investigate the possible relationship between observed variables and underlying latent constructs (Suhr, 2004). It was used to validate the uni-

dimensionality of the constructs (whether the components in the construct actually constitute a single factor). If the CFA was unable to validate the uni-dimensionality of a construct or a factor structure, the EFA was performed first to investigate the factor structure. Suhr (2015) maintains the use of CFA may be influenced by the research hypothesis, the adequate sample, calculating instruments, multivariate normality, parameter detection, outliers, incomplete results, and analysis of model fit indices. These concerns were examined to identify the validity of the findings. The next section discusses the Structural Equation Modeling.

4.15.2 Structural Equation Modeling (SEM)

Structural equation modelling is a multivariate statistical analysis method used to analyse structural correlations. This approach is a mixture of factor analysis and multiple regression analysis and is used to evaluate the structural correlations between tests variables and latent constructs. The researcher preferred this approach because it evaluates multiple and interrelated dependencies in a single study. Two forms of variables are utilised in this analysis. These are endogenous variables and exogenous variables. Endogenous variables are equal to dependent variables and are equivalent to independent variables. The SEM is also utilised to measure and develop a model (Serumaga-Zake, 2016; StatisticsSolution, 2020).

Structural Equation Modeling (SEM) is a statistical package that enables complex correlations between independent and dependent variables. Variables may be one or more. While there are many approaches to classify SEM, it is most widely considered to be a combination of some regression and some factor analysis. SEM has been implemented to conduct this analysis. SEM is a technique for the description, calculation and measurement of a set of connections between variables.

It is a systematic mathematical technique employed to evaluate the hypothesis of a relationship between observed and latent variables, a framework implemented to describe, predict and validate a theory used to examine hypothesized patterns of directional and non-directional interactions between a series of observed (measured) and unobserved (latent) variables. The two aims of the SEM are: 1) to understand the patterns of correlation/covariance between a series of variables and 2) to describe as much of their variance as feasible for the defined model (Hox and Bechger, 2001).

The term "parsimony" means the creation of the simplest and shortest optimal regression model. Parsimony-corrected fit indexes in SEM are absolute fit indexes that are similar to most of the fit indexes of the standard, such as Δ2, GFI and AGFI. Adjustments meant to punish models that are not parsimonious so that simplified computational systems are favoured to more complicated ones. The more the model confused, the lower the fit index. The parsimonious match indexes comprise PGFI (centred on the GFI), PNFI (centred on the NFI), PNFI2 (centred on the Bollen IFI) and PCFI. See Table 4.4.

Table 4.4: Fit test of the model

Absolute fit measures	X^2 with 71 degrees of freedom Goodness of fit index (GFI) Root mean square error of approximation (RMSEA) P.value for test of close fit (RMSEA) Expected cross-validation index (ECVI) ECVI for saturated model ECVI for independence model Adjusted goodness of fit index (AGFI)
Incremental fit measure	Normed fit index (NFI) Non-normed fit index (NNFI) Comparative fit index (CFI) Incremental fit index (IFI) Relative fit index (RFI)
Parsimonious fit measures	Parsimony normed fit index (PNFI) Parsimony goodness of fit index (PGFI) Critical N (CN) Normed X^2

Source: Hair et al. (1998: 601)

Finally, the fit of the internal structure of the model was conducted to test the internal quality of the model.

4.15.2.1 Regression analysis

A regression analysis was done to determine other important factors that affect Entrepreneurial Development (ED) proxied by Entrepreneurial Performance (EP). These included the directly measured and observable variables that concerned socio demographic information, business knowledge or skills, business profile, reasons for starting a business and constraints they face in doing business in Kigali. These were the independent variables.

A regression model can be written as:

$$Y = \alpha + \beta x + e$$

Where Y is the dependent variable (e.g., INN1), x is a non-random variable, which is the independent variable (i.e., KM factor) and e is a random error distributed with mean zero and variance σ^2. α and β are the coefficients of the model. β is the effect of the independent variable (i.e., reverse auction) on the dependent variable. The hypothesis that were tested were as follows:

Hypothesis 1

H_0: Business knowledge or skills (i.e., entrepreneurial skills and business skills) do not affect EP.

H_1: Business knowledge/skills affect EP positively.

H_1 referred to the regression model that involved Entrepreneurial performance as the dependent variable and business knowledge or skills as the independent variables, which was fitted. The coefficient of a business knowledge or skill was the effect of business knowledge or skill on EP. This was tested using the t –test (i.e. whether it was statistically significant from zero (0). If the probability of the t value occurring (as calculated from the sample values), was less than 0.05 (the level of significance) the null hypothesis was rejected and the alternative hypothesis that business knowledge or skills positively affect EP would be accepted. If the probability was more than 0.05, it would not be rejected, and if it was equal to 0.05, the null hypothesis would be inconclusive, regardless of whether the t -value was negative or positive.

Hypothesis 2

H_0: Business profile (i.e., time of operation of the business or age of business, capital, etc) does not affect EP.

H_1: Business profile affects EP.

Hypothesis 2 referred to the regression model that involved EP as the dependent variable and business profile as the independent variable, which was fitted. The coefficient of business profile was the effect of business profile on EP. This was tested using the t –test (i.e., whether it was statistically significant from zero (0). If the probability of the t value occurring (as calculated from the sample values), was less than 0.05 (the level of significance) the null hypothesis was rejected and the alternative hypothesis that business profile affects EP would be accepted. If the probability was more than 0.05, it would not be rejected, and if it was equal to 0.05, the null hypothesis would be inconclusive, regardless of whether the t -value was negative or positive.

Hypothesis 3

H_0: Reasons and permission from husband or family do not affect EP.

H_1: Reasons and permission from husband or family affect EP.

Hypothesis 3 referred to the regression model that involved entrepreneurial performance as the dependent variable and reasons and permission from husband or family as the independent variables, which was fitted. The coefficients of reasons and permission from husband or family were the effects of the factors on EP. This was tested using the t –test (i.e. whether it was statistically significant from zero (0). If the probability of the t value occurring (as calculated from the sample values), was less than 0.05 (the level of significance) the null hypothesis was rejected and the alternative hypothesis that reasons and permission from husband or family affect EP would be accepted. If the probability was more than 0.05, it would not be rejected, and if it was equal to 0.05, the null hypothesis would be inconclusive, regardless of whether the t -value was negative or positive.

Hypothesis 4

H_0: Constraints that face women-owned small and medium enterprises do not affect EP.

H_1: Constraints that face women-owned small and medium enterprises affect EP negatively.

Hypothesis 4 referred to the regression model that involved entrepreneurial performance as the dependent variable and constraints that face women-owned small and medium enterprises as the independent variables, which was fitted. The coefficient of constraints that face women-owned small and medium enterprises was the effect of constraints that face women-owned small and medium enterprises on EP. This was tested using the t –test (i.e., whether it was statistically significant from zero (0). If the probability of the t value occurring (as calculated from the sample values), was less than 0.05 (the level of significance) the null hypothesis was rejected and the alternative hypothesis that constraints that face women-owned small and medium enterprises negatively affects EP would be accepted. If the probability was more than 0.05, it would not be rejected, and if it was equal to 0.05, the null hypothesis would be inconclusive, regardless of whether the t -value was negative or positive.

Hypothesis 5

H_0: Use of ICT (i.e., Online Access (OLA & skills) does not affect ED.

H_1: Use of ICT (i.e., Online Access (OLA & skills) affects ED positively.

Hypothesis 5 referred to the regression model that involved ED as the dependent variable and Use of ICT as the independent variables, which was fitted. The coefficient of Use of ICT was the effect of Use of ICT on ED. This was tested using the t –test (i.e., whether it was statistically significant from zero (0). If the probability of the t value occurring (as calculated from the sample values), was less than 0.05 (the level of significance) the null hypothesis was rejected and the alternative hypothesis that Use of ICT affects ED would be accepted. If the probability was more than 0.05, it would not be rejected, and if it was equal to 0.05, the null hypothesis would be inconclusive, regardless of whether the t -value was negative or positive.

Hypothesis 6

H_0: Role of Leadership and stakeholders do not affect EP.

H_1: Role of Leadership and stakeholders affects EP.

Hypothesis 6 referred to the regression model that involved Entrepreneurial performance as the dependent variable and role of leadership and stakeholders as the independent variable, which was fitted. The coefficient of role of leadership and stakeholders was the effect of role of leadership and stakeholders on EP. This was tested using the t –test (i.e. whether it was statistically significant from zero (0). If the probability of the t value occurring (as calculated from the sample values), was less than 0.05 (the level of significance) the null hypothesis was rejected and the alternative hypothesis that the role of leadership and stakeholders affects EP would be accepted. If the probability was more than 0.05, it would not be rejected, and if it was equal to 0.05, the null hypothesis would be inconclusive, regardless of whether the t -value was negative or positive.

4.15.2.2 The logistic function

Logistic regression was used to determine the effect of the business profile (i.e., industry and capital) on entrepreneurship. The logistic function is generally used to determine the factors of a categorical variable. The logistic curve (Figure 4.8) is used to model a categorical or binary dependent variables coded 0 or 1 because (unlike the linear regression function) the logistic function is bounded by 0 and 1.

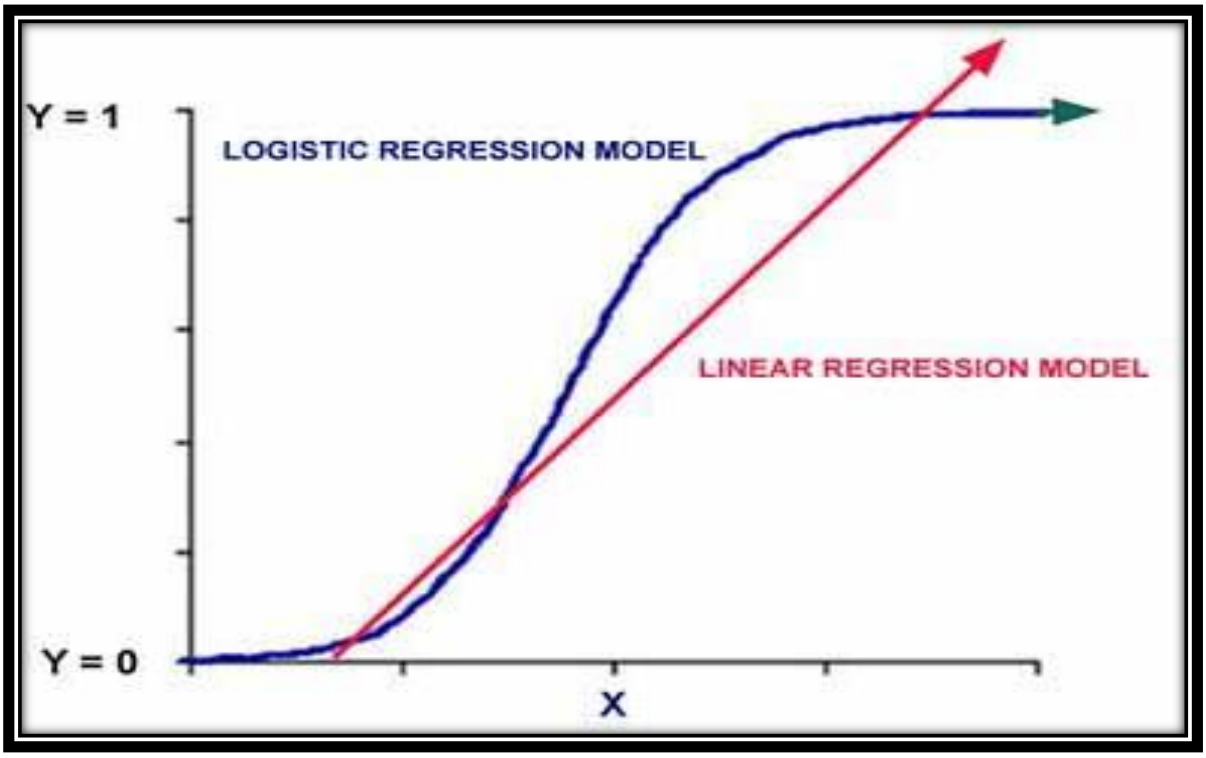

Figure 4.8: Logistic curve

The logistic function is used to predict the probability of an event, which is a particular value of y, the dependent variable.

Let π_i be the probability that an individual *i* will carry out an entrepreneurial activity. He can model this probability in terms of the *log odds* of entrepreneurship, called the *logit,*

$$\log it(\pi_i) = \log\left(\frac{\pi_i}{1-\pi_i}\right) \qquad (1)$$

The *logistic regression model* fits the log odds by a linear function of the independent variables (or the factors that affect an entrepreneurial activity (or entrepreneurship), the event).

$$\log it(\pi_i) = \alpha + x_{i1}\beta_1 + ... + x_{ij}\beta_j + ... + x_{ip}\beta_p \qquad (2)$$

Where α is the intercept and β_j is the regression coefficient associated with the independent variable x_j and the effect of x_j on the log odds (entrepreneurship).

Logistic coefficients vary between plus and minus infinity, with 0 indicating that the given independent variable does not affect the logit (that is, it makes no difference in the probability of the entrepreneurship equalling 1). If β is positive (or negative), then as the dichotomous independent variable moves from 0 to 1, the log odds (logit) of Entrepreneurship performance increases (or decreases) and also the corresponding odds ratio Exp (β) also increases (or decreases).

Technically, by default the event is y = 1 for a binary dependent variable coded 0, 1, when the reference category is 0. Exp (logit (Entrepreneurial activity)) is the odds ratio for Entrepreneurial activity, being the odds that Entrepreneurial activity equals 1 rather than 0. The inverse transformation of (1) and (2) is the logistic function,

$$\pi = \frac{\exp(\alpha + x'_i\beta)}{1+\exp(\alpha + x'_i\beta)} \qquad (4)$$

which gives predicted probabilities, or

$$\pi = \frac{1}{1 + \exp(-\alpha - x'_i \beta)}$$

With this functional form:

if you let $\alpha + x'_j \beta$ =0, then π = .50

as $\alpha + x'_j \beta$ gets really big, π approaches 1

as $\alpha + x'_j \beta$ gets really small, π approaches 0

Instead of the slope coefficients (β) being the rate of change in Y (the dependent variables) as X changes (as in the OLS regression), the slope coefficient is interpreted as the rate of change in the "log odds" as X changes.

The data analysis part of this chapter addressed various analysis and tests to be done. Table 4.5 points out various types of stats that the researcher will be providing and a brief explanation of the numbers computed and what they mean are shown in Table 4.5.

Table 4.5 Summary of statistics performed

Serial No.	Objective	Question/Variable	Data Analysis	Reason/Meaning
1	-	-	Reliability tests (using Cronbach's Alpha coefficient).	To summarise the data and profile the target population.
2	-	-	Exploratory analysis (frequency distribution) will be done to edit the data by checking for outliers.	To find out whether data makes sense or not.
3	-	Sociodemographic variables	Mean score, standard deviation, frequencies and percentages distributions, pie charts and bar graphs to depict the data will be calculated.	To summarise the data and profile the target population
4	To investigate whether was a connection between women's pull, push factors and starting businesses in Kigali	Reasons for starting a business: What is the motivation for women-owned enterprises in Kigali, Rwanda to start a business?	1. Descriptive statistical analysis (i.e., using frequency and percentage distributions, will be done 2. Correlation analysis	1. To summarise the data and identify the reasons why business owners started the business. 2. To test hypothesis 1: hypothesis "There is a positive relationship between motivation and new women enterprises creation in Kigali, Rwanda".
5	To identify the socio-economic factors influencing women in Kigali, Rwanda to join entrepreneurship.	• Business knowledge/skills • Business profile	Logistic regression will be done. Entrepreneurship be the dependent variable and Business knowledge/skills and business profile will be the independent variables.	To determine the factors that affect the entrepreneurship.
6	1. To identify the constraints experiencing women entrepreneurs in	Constraints face women-owned small	1. Descriptive statistical analysis (i.e., using frequency and percentage distributions, will be done	1. To identify the constraints experiencing women entrepreneurs in doing small

	doing small and medium business in Kigali, Rwanda 2. To identify whether there was a relationship between challenges faced women-owned SMEs in Kigali and the small-scale businesses the run. 3. To determine whether women-owned SMEs in Kigali leverage the Internet to find the solution to constraints they faced in doing SMEs in Kigali	and medium enterprises in Kigali	to summarise the data. Also, inferential statistical analysis with the t-test will be used to make a decision to agree or disagree with the statement. 2. Correlation analysis	and medium business in Kigali, Rwanda. 2. To test hypothesis 2: "There is a negative relationship between the constraints faced by women-owned businesses in Kigali, Rwanda and the management of small-sized enterprises". 3. To test hypothesis 3: "There is a negative relationship between constraints faced by women-owned business in Kigali, Rwanda and the use of Internet into women businesses in Kigali, Rwanda to find a solution to those constraints."
7	To explore how information and communication technology could intervene to find the solution to constraints facing women entrepreneurs in doing small and medium business in Kigali, Rwanda	The contribution of ICT to improve women businesses and find a solution to constraints they face in doing business in Kigali.	Descriptive statistical analysis (i.e., using frequency and percentage distributions, will be done to summarise the data. Also, inferential statistical analysis with the t-test will be used to make a decision to agree or disagree with the statement.	To find out how information and communication technology could intervene to find the solution to constraints facing women entrepreneurs in doing small and medium business in Kigali, Rwanda
8	1. To investigate whether the Rwanda administration and stakeholder's information and communication technology policies support the successful integration and use of information and	The contribution of ICT to improve women businesses and find a solution to constraints they face in doing business in Kigali.	1. Descriptive statistical analysis (i.e., using frequency and percentage distributions, will be done to summarise the data. Also, inferential statistical analysis with the t-test will be used to make a decision to agree or disagree with the statement.	1. To find out whether the Rwanda administration and stakeholders' information and communication technology policies support the successful integration and use of information and communication technology in

	communication technology in women enterprises in Kigali, Rwanda 2. To investigate the role stakeholders played to facilitate the integration of ICT into women business in Kigali. the quantitative survey collected data		2. Correlation analysis	women enterprises in Kigali, Rwanda 2. To test hypothesis 4: “There is a positive relationship between stakeholders’ ICT initiatives and effective integration and use of ICT in women enterprises in Kigali, Rwanda in order to ensure competitiveness”.

4.16 Secondary data collection

Secondary data refers to any available data, which collected by other researchers for another objective but have a relationship with the current study. It differs from primary data collected by the researcher direct from the resource, for instance, from respondents (Foley, 2018; Wisedom, 2018). In this study, primary data is collected directly from women-owned SMEs in Kigali. In contrasts, secondary data was those data in the literature review collected with other researcher such as organisation reports, government publications, journal articles, and theses, among others.

According to Horn (2018), secondary data adds value to primary data by playing a critical role in data analysis. It reinforces that the primary data, validity, reliability, and results can influence the right conclusion and recommendation. The comparison of primary and secondary data helps a researcher to identify a gap and get a better understanding of the problem under investigation.

Foley (2018) reports that secondary data intervenes in answering research questions and test hypothesis. The researcher collected secondary data from different sources, including government publication, government gazette, journal article, thesis and dissertation, reports, magazine, newspapers, conference proceedings, legislation, books, and Internet. The next section focuses on validity and reliability.

4.17 Validity

Validity refers to any consultation, correction; adjustment done on research design and its components to improve quality (Kumar, 2011). The validity of instrument is achieved when it achieves what it assumes to measure; it must cover all aspects of the phenomenon under investigation. The researcher consulted experts and other researchers for review, to ensure a standard instrument, valid to collect data where results can be generalised to women-owned SMEs in Kigali (Maree, 2007). In line with Jensen and Laurie (2016), the validity of the questionnaire was defined on how women-owned business in Kigali responded and how the results were obtained. They were happy with the questionnaire, their responses were high quality, and 409 questionnaires were collected contrary to 377 programmed. Validity and reliability

complete each other, but, validity of the instrument comes before the instrument being reliable (Maree, 2007). The next section emphasises reliability.

4.18 Reliability

In the life of a human being, the word reliability is often used to express a person who is honest, wise, available and trusted. In the research context, the meaning of reliability involves testing, experimenting, and measuring results multiple times and obtaining the same results. For instance, a research instrument is reliable when it used to collect data from a target population and obtain results; later, perhaps a long time, other researchers conduct the same study, using the same research instrument on the same sample population and obtain the same results as previous (Maree, 2007; Plooy, 2009; Kumar, 2011).

The credible responses of women entrepreneurs in Kigali provided in the survey proved reliability; results could be generalised to the entire women-owned SMEs. However, low response rate and no credible response confuse results and are not reliable, consequently cannot be generalised to all population. Therefore, it is the responsibility of the researcher to construct a valid and reliable research instrument, most importantly to capture the confidence of respondents so that they can provide true information (Maree, 2007; Plooy, 2009). Based on the findings, the researcher will design a framework.

4.19 Framework design

A framework is regarded as grounded because it is a replication of all study compounds; it simplifies huge things, findings or theories to a simple, understandable structure that forecast a solution of a phenomenon (Wisconsin-Milwaukee, 2018). The researcher analysed the research statement, question, current scholars, and results and proposed a framework that can be used by an individual or organisation to be more efficient and effective. Designing a model brings new knowledge and know-how in solving a problem (Wisconsin-Milwaukee, 2018). The researcher designed an ICT model that predicts women businesses improvement and competitiveness and whether it is applied correctly. The next section discusses the ethical considerations as a guide for the researcher during the journey of research.

4.20 Ethics and code of conduct

Like any organisation or activity, research also has its culture, code of conduct that researchers must apply during the course of action and after. This is because researchers must keep information obtained during the research process confidential, particularly during data collection (Kumar, 2011). Maree (2007) points out that scientifically, ethics is about knowledge of what is right or wrong, what the researcher must do or avoid in the research process. Code of conduct is a social rule guiding a society or an organisation; it is based on values, beliefs, and culture of society or organisation (Maree 2007). Kumar (2011) argued that the law must punish researcher misconduct and unethical data collection. Research institutions have rules and can penalise researchers who conduct studies unethically. Data collection from women-owned business in Kigali and report writing was conducted in line with CPUT research ethics policy (Maree 2007; CPUT, 2013).

Women entrepreneurship in Kigali is multicultural, and the researcher must respect their culture. This section is presented in two parts. The first part discusses researcher ethical consideration towards respondents; it included informed consent; privacy; anonymity and confidentiality, and avoids harm. The second part deals with researcher ethical consideration during the process of the research. It includes avoiding bias; wrong research methodology; incorrect reporting, misusing information and copyright. The discussion of ethics and code of conduct starts with ethics consideration for the survey.

4.20.1 Ethic consideration for the respondents

This study was conducted ethically, following the CPUT ethical considerations during the research process. Ethic consideration is divided into two sections. The first section concerning the ethic consideration applies to the field during the data collection. It deals with the women-owned SMEs in Kigali who contributed to the survey. Secondly, ethic consideration also regards the researcher and what he must do and avoid during the study journey. Ethic consideration in the field included informed consent, privacy, anonymity, confidentiality, and avoiding harm. It also included the researcher avoiding bias, incorrect methodology, wrong reporting, wrong use of information, and copyright. The following section introduces the informed consent.

4.20.1.1 Informed consent

Respondents were informed of the objective of data collection. They were presented with a letter from the chamber of women entrepreneur in Rwanda that authorises researchers to gather data from women-owned business in Kigali and ethics approval issued by CPUT (See Appendix C & F).

4.20.1.2 Privacy

The researcher assistant respected the right of the respondents, while conducting research and collecting data from them. They reserved the right to reject their contribution in the survey, but no one withdrew from the survey due to proper preparation before starting data collection. The right to not respond to some questions was respected, and the researcher assistant did not ask why. When there were customers, the researcher assistant waited for them to be served before continuing with the survey. The following section highlights anonymity and confidentiality.

4.20.1.3 Anonymity and confidentiality

The researcher assistant did not ask respondents their names. He ensured them that the information provided would be kept confidential.

4.20.1.4 Avoid harm

During data collection, measures such as politely approaching respondents, providing a gentle introduction, and smiling among others were taken to ensure that no physical, psychological or emotional harm was caused. The researcher assistant monitored every respondent to make sure that there was no form of harm or negative emotion in the data collection process (Kumar, 2011). The following section deals with research ethics consideration.

4.20.2 Ethics considerations of the researcher

Research is a project with a life span; it starts and ends (Larson & Gray, 2014). During the process of conducting the research, the researcher has a code of conduct guiding them. Kumar (2011) proposed that problems such as bias, applying the incorrect methodology, and wrong use of information can be avoided to achieve valid and reliable results. These ethical issues are discussed below.

4.20.2.1 Escaping bias

Bias is a misconduct of a researcher who intentionally provides wrong information. They manipulate data to show a positive outlook, while hiding data they consider not good. The researcher presented data and results as they were collected and analysed. He avoided any kind of data manipulation, as it does not meet the principles of research ethics.

4.20.2.2 Incorrect methodology

It is unethical for the researcher to select the wrong methodology to conduct the research. It is further unethical to design a biased data collection instrument as this impacts of the validity and reliability of the research. The quantitative method was identified as an appropriate method to determine the importance of ICT in women-owned SMEs in Kigali, Rwanda. The next section emphasises the wrong use of information.

4.20.2.3 Wrong use of information

The research was aware of what the wrong use of information could result in. Therefore, the information collected from respondents was used only for this research. There is no negative impact on women-owned SMEs in Kigali surveyed. The following section highlights copyright.

4.20.2.4 Copyright

The researcher respects the right of authors and referenced all material consulted in writing the thesis.

4.21 Summary of this chapter

The purpose of this research is to identify the importance of ICT in women-owned businesses in Kigali, Rwanda. The researcher views this objective in a positivism philosophy and deductive reasoning approach, which believes in the sciences to search and find new knowledge. The process of finding the importance of ICT in women-owned businesses in Kigali involved women-owned businesses in Kigali and the research methods.

Since the positivism philosophy underpins the study, and the study seeks to measure the opinion of women entrepreneurship in Kigali, quantitative method design was identified as the suitable method to carry out the study. Data collection yielded 409 survey questionnaires from a sample of women-owned businesses in Kigali. The data was collected ethically as stipulated by CPUT. SPSS and Stata software was used to analyse data and build an integrated model. The following chapter presents and discusses the findings.

CHAPTER FIVE
DATA PRESENTATION AND DISCUSSION OF FINDINGS

5.1 Introduction

The previous chapter presented the research methodology. This chapter focusses on empirical data presentation and discussion. Walliman (2011) stated that data presentation refers to the organisation of data collected in a way that facilitates the researcher to interpret and discuss the findings. The secondary data was used during the discussion of findings to compare the findings of this study with the existing results. Horn (2018) argued that secondary data adds importance to primary data by playing a vital role in data interpretation, improving primary data quality, precision, and findings that may affect the right inference and recommendation. The analysis of primary and secondary data allows the researcher to recognise the discrepancy and have a better understanding of the issue under investigation. Some of the results and tests conducted are refered to in Appendix B.

Before interpreting the results, the main aims of the research are emphasised. The purpose of this research was to identify the importance of ICT in women-owned businesses in Kigali, Rwanda.

The chapter is structured as follows:

- 5.2 Presents descriptive data analysis
- 5.3 Reliability test
- 5.4 Test for normality
- 5.5 Inferential data analysis

5.2. Descriptive data analysis

SECTION 1: SOCIO-DEMOGRAPHIC INFORMATION

The presentation and discussion of the results begin with socio-demographic information of women-owned SMEs in Kigali. Seven questions (see Appendix A) which contain the information regarding the characteristics of 409 women-owned SMEs in Kigali are answered. The researcher asked social-demographic questions to know the characteristics of the respondents in terms of marital status; group categories of married; age; education; nationality, membership of RCWE, and what they were doing before starting their businesses. The information received from the owners of the women-owned SMEs in Kigali is presented in frequency and percentage. The data presentation and discussion of results starts with the marital status of respondents.

5.2.1 Marital status

The question was “Are you married”. The reason for this question was to identify the marital status of the owners of the women-owned SMEs in Kigali. Findings are presented in Table 1 (Appendix B). Of the 409 participants in this study, the majority, (79.46%) were married.

5.2.2 If yes, please indicate your marital status

This question was asked to indicate the categories of their marital status. The objective of this question was to identify to which extent each category was involved in the business. The findings are displayed in Table 2 (Appendix B). According to the Table, of the 328 people who claimed to be married, (75.61%) were still married; 24 (7.32%) were widowed. Figure 5.1 illustrates this more clearly.

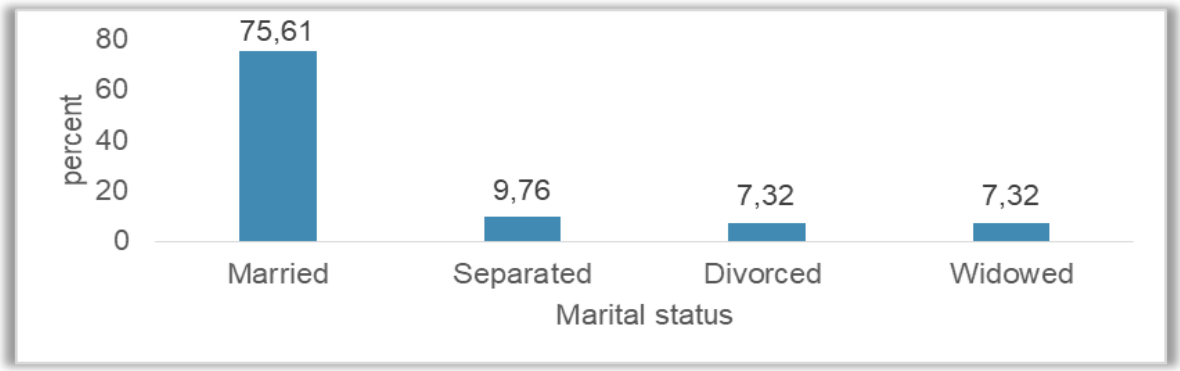

Figure 5.1: Marital status (in detail)

5.2.3 Age group of respondents

The question was “How old are you as at your last birthday"? The answer was given in terms of complete years a person had lived on the earth, and to have knowledge of the age of the owners of the women-owned SMEs in Kigali. The findings are shown in Table 3 (Appendix B) and Figure 5.2. The data showed that the youngest four (4) respondents were 22 years old and the oldest respondent was 56 years old. The Table shows the age groups of the respondents. It is indicated that the majority of respondents (45.3%) fell in the age group of 31-40 years. Very few respondents were above 50 years old (3%). Figure 5.2 illustrates this more clearly.

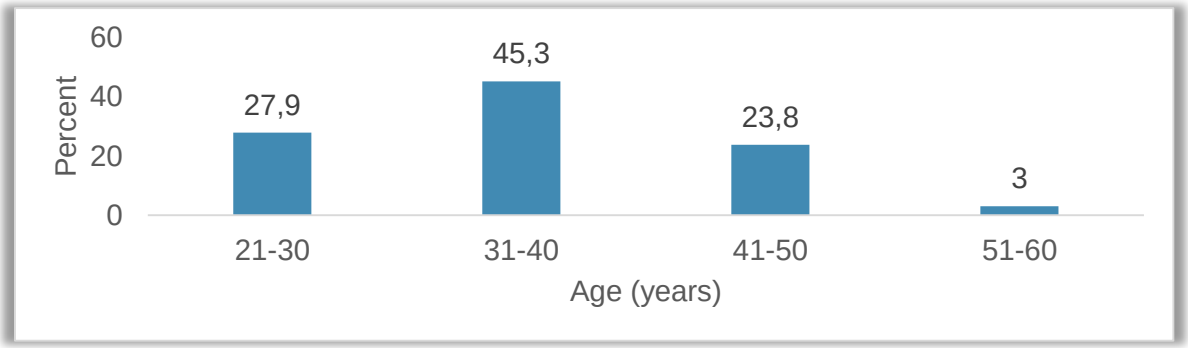

Figure 5.2: Age group

5.2.4 Level of education

The question was, “What is your level of education"? The purpose of this question was to identify the education level of respondents, and to find out whether there was a connection between education and running a SME. According to Table 4 (Appendix B) and Figure 5.3, the majority of respondents (42.6%) had secondary school education. There were 25 (6.2%) respondents with no education and 2 (0.5%) with a Doctorate degree.

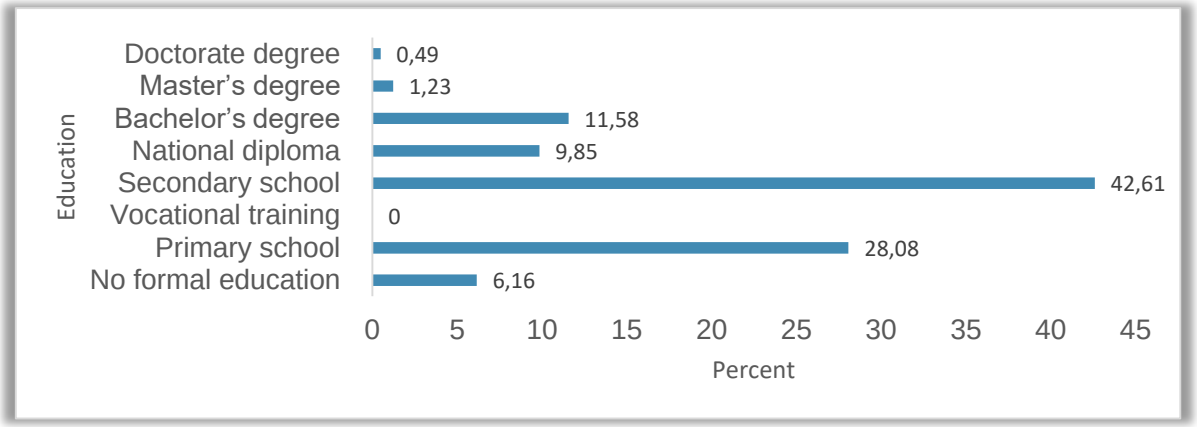

Figure 5.3: Education

5.2.5 Nationality of respondents

The question was “What is your nationality”? The objective was to know the nationalities of the owners of women-owned SMEs in Kigali in two dimensions, that is, citizen and foreign. Table 5 (Appendix B) shows that almost all the respondents were Rwandan (98.9%).

5.2.6 Membership of Rwanda Chamber of Women Entrepreneurs

The question was “Are you a member of the Rwanda Chamber of Women Entrepreneurs (RCWE)”? The reason for the question was to find out whether the owners of women-owned SMEs in Kigali surveyed, had RCWE membership. The findings are displayed in Table 6 (Appendix B). Almost all the respondents (95.6%) answered “No” to this question.

5.2.7 Occupation before you started a business

The question was “What did you do before you started a business”? The intention of this question was to know what the owners of the women-owned SMEs in Kigali were doing before launching their businesses. The findings distinguish among them from necessity and opportunity entrepreneurs. The results are presented in Table 7 (Appendix B). Most respondents (57.5%) did not have a job before they started a business. There were very few (2%) who were doing the same business for an employer. Figure 5.4 illustrates this more clearly.

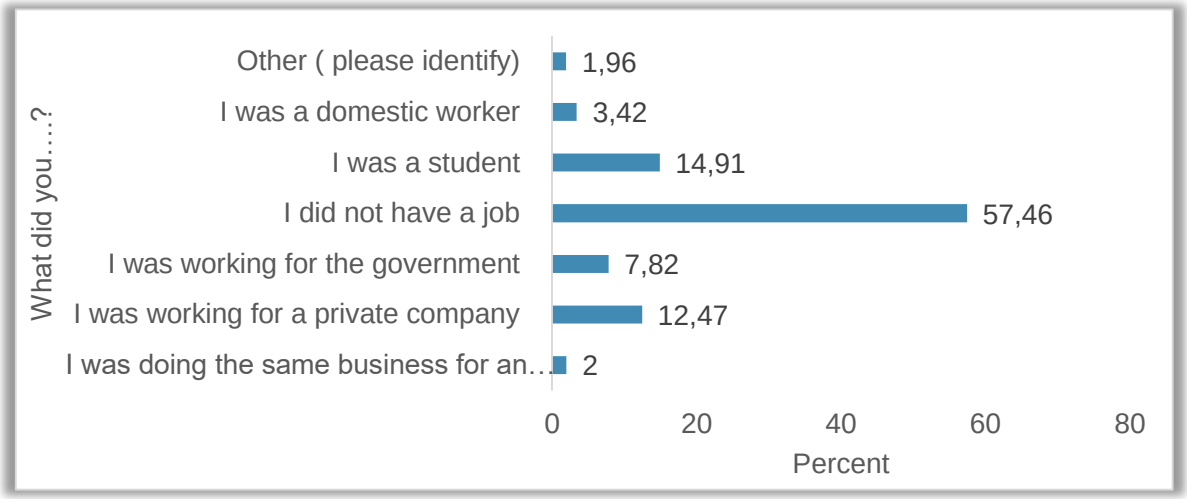

Figure 5.4: Employment before you started a business

Based on the findings in Table 7 and Figure 5.4, it can be argued that the majority (57.5%) (N=235) of women-owned SMEs in Kigali were necessity entrepreneurs; they started businesses due to the lack of another source of income to satisfy their needs. This finding is consistent with that of Fatoki (2014) who maintains that many young South African women entrepreneurs joined entrepreneurship due to lack of employment in public or private sectors. It is also consistent with that of Kelley et al. (2017) who found that in the countries which are members of global entrepreneurship monitor, the majority of the owners of women-owned SMEs were necessity entrepreneurs, and they joined entrepreneurship due to lack of employment in public and private sectors. The next section summarises the sociodemographic section.

Summary of this section

In summary, it evident that of the owners of the women-owned SMEs in Kigali 79.46% were married and 75.61% living with partners. The majority (45.3%) of them fell into the age group of 31-40 years. Regarding education, secondary schooling dominated with 42.6%. The vast majority (98.9%) were Rwandan citizens. Nevertheless, 95.6% were not members of RCWE. Finally, the majority (57.5%) were unemployed before starting a business. The next section (2) presents the business skills among the respondents.

SECTION 2: BUSINESS KNOWLEDGE AND SKILLS

This section discusses the business knowledge and skills among the surveyed owners of women-owned SMEs in Kigali. It answers four questions as listed in the questionnaire (see Appendix A). The objective of this section was to gain information from respondents regarding their knowledge and skills in business.

5.2.8 Learning business courses before starting business

The question was “Did you have an opportunity to participate in learning business courses or modules before you started a business?" The reason for the question was to find out whether the respondents had business skills. The findings are presented in Table 8 (Appendix B) shows that a large number of respondents (90.7%) did not have an opportunity to participate in learning business courses or modules before they launched their businesses. This is outlined in Figure 5.5.

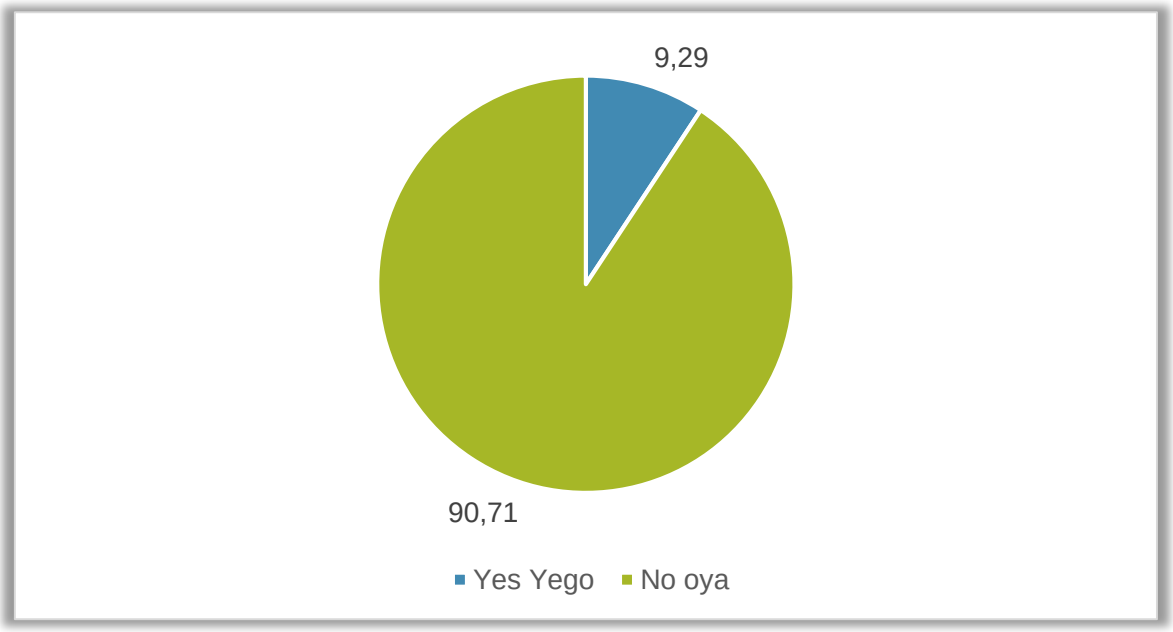

Figure 5.5: Opportunity to participate in learning business courses

5.2.9 Entrepreneurship training before launching business

The question was “Did you attend an entrepreneurship training before you launched business"? The purpose of the question was to find out whether the respondents attended entrepreneurship training before they started a business.

Table 9 (Appendix B) shows the percentage distribution for respondents who attended an entrepreneurship training before they launched their businesses. The table shows that out of 403, the majority, 367 (91.1%) did not attend an entrepreneurship training before they launched their businesses. Figure 5.6 illustrates this more clearly.

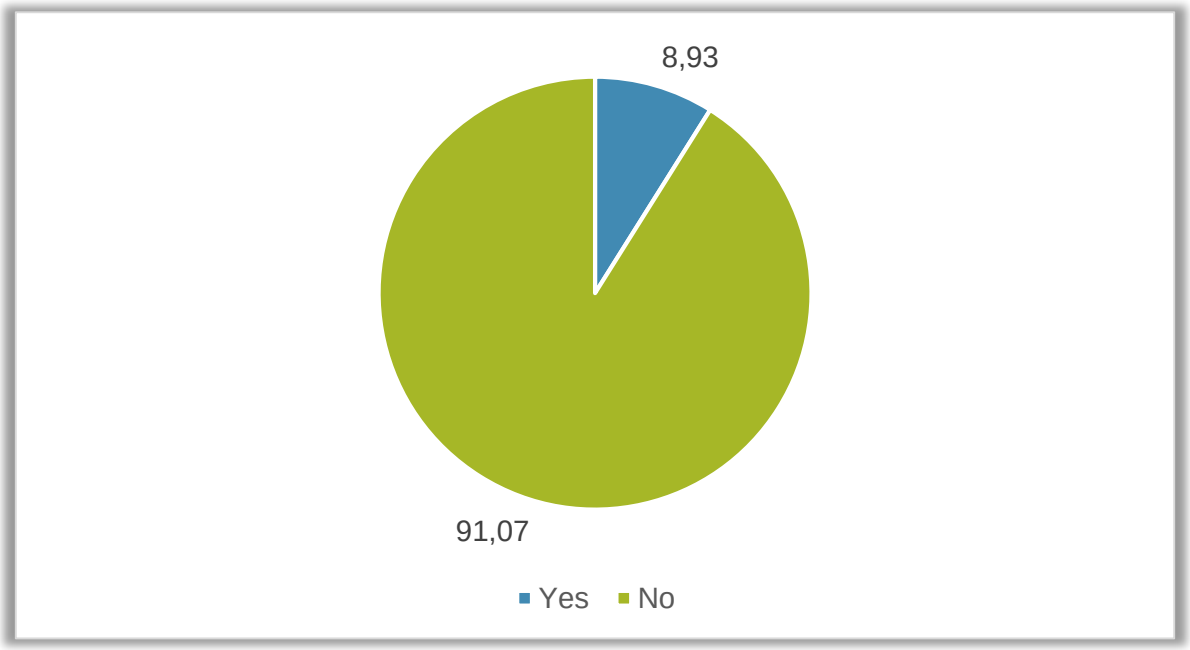

Figure 5.6: Entrepreneurship training

5.2.10 If yes to question 9, mention the training organiser

The question was “If yes to previous question 9, who was your training organiser”? The reason for this question was to identify the organisation which trained the owners of women-owned SMEs in Kigali before they started businesses. Following up on question 9, Table 10 (Appendix B) indicates that for those who attended a training, the Chamber of Women Entrepreneurs (20.5%) and Private Sector Federation (28.2%) organised most of the training courses. This is illustrated in Figure 5.7.

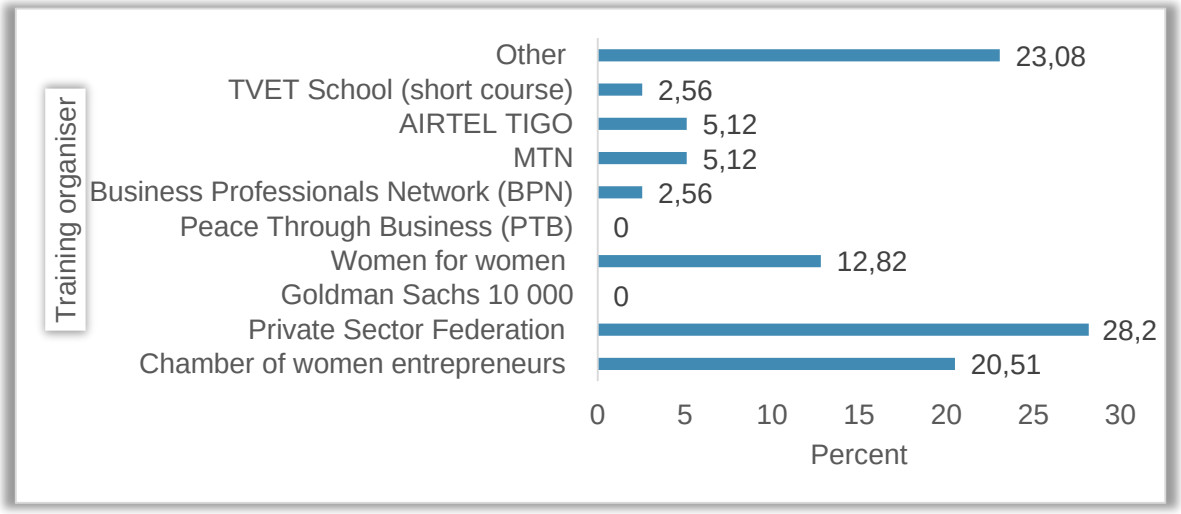

Figure 5.7: Training organiser

5.2.11 If you attended training (Question 9), indicate how you were helped in business

The question was “How did training help you in doing better business”? The purpose of this question was to find out whether the fields of business training improved. Table 11 (Appendix B) and Figure 5.8 shows the percentage distribution of how entrepreneurship training helped the respondents in doing better business. It shows that the training helped them by equipping them with skills of bookkeeping (14.6%), entrepreneurship (18.4%), marketing (13.9%) and networks relationship (13.3%).

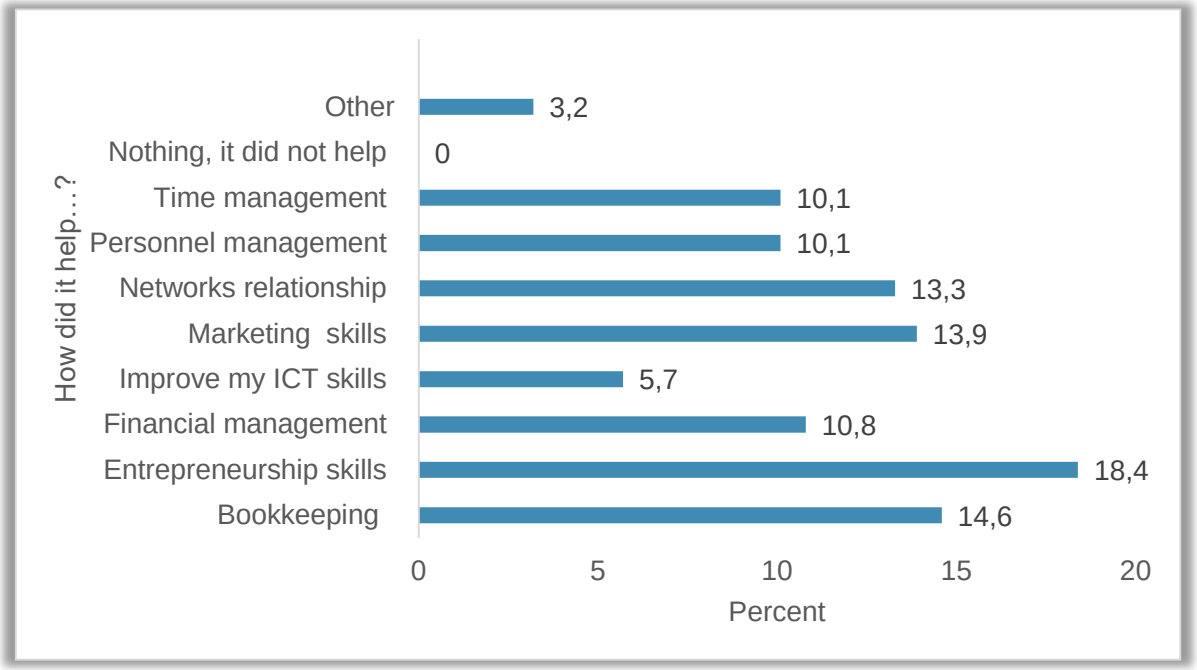

Figure 5.8: The benefit of entrepreneurial training in doing better business

SUMMARY OF THIS SECTION

In conclusion, it was found that the vast majority (90.7%) of owners of women-owned SMEs in Kigali did not have any education-related business before launching their business. Furthermore, (91.1%) did not train in entrepreneurship. Those who trained, received most of the training (48.7%) from PSF and RCWE. The results showed that (18.4%) reported that training improved their entrepreneurship skills. The next section presents the business profile.

SECTION 3: BUSINESS PROFILE

The previous section discussed the business management skills of respondents. This section presents the business profile. The objective was to identify the state of women-owned SMEs in Kigali. This section has 20 questions from 12 to 31 (see Appendix A). Questions 18 and 20 were about Rwanda's currency (see Appendix A). At the time of presenting these findings, the researcher did a comparison between Rwanda's currency (site of study), South Africa's currency (researcher university) and USA's currency (international currency): One South African Rand (Rand) = 56.66 Rwandan Franc (RwF); One American Dollar (USD) = 950.98 RwF (Currency Converter, 2020).

5.2.12 Number of businesses

The question was "How many businesses do you have"? The reason for the question was to know the number of businesses each owner of women-owned SMEs in Kigali had. The findings are displayed in Table 12 (Appendix B). According to the data, the majority of respondents (97.05%) had 1 business.

5.2.13 Legal category of business

The question was "What is the legal category of your business"? The purpose of the question was to identify the legal business status of women-owned SMEs. Table 13 (Appendix B) reveals that most businesses were sole proprietorships (98.3%).

5.2.14 Industry

The question was "Which industry does your business operate in"? The reason for this question was to identify the industry sector in which the businesses operated. According to Table 14 (Appendix B) and Figure 5.9, most of the businesses were operated in services (58.58%), retail (21.81%) and wholesale industries (11.52%), in that order.

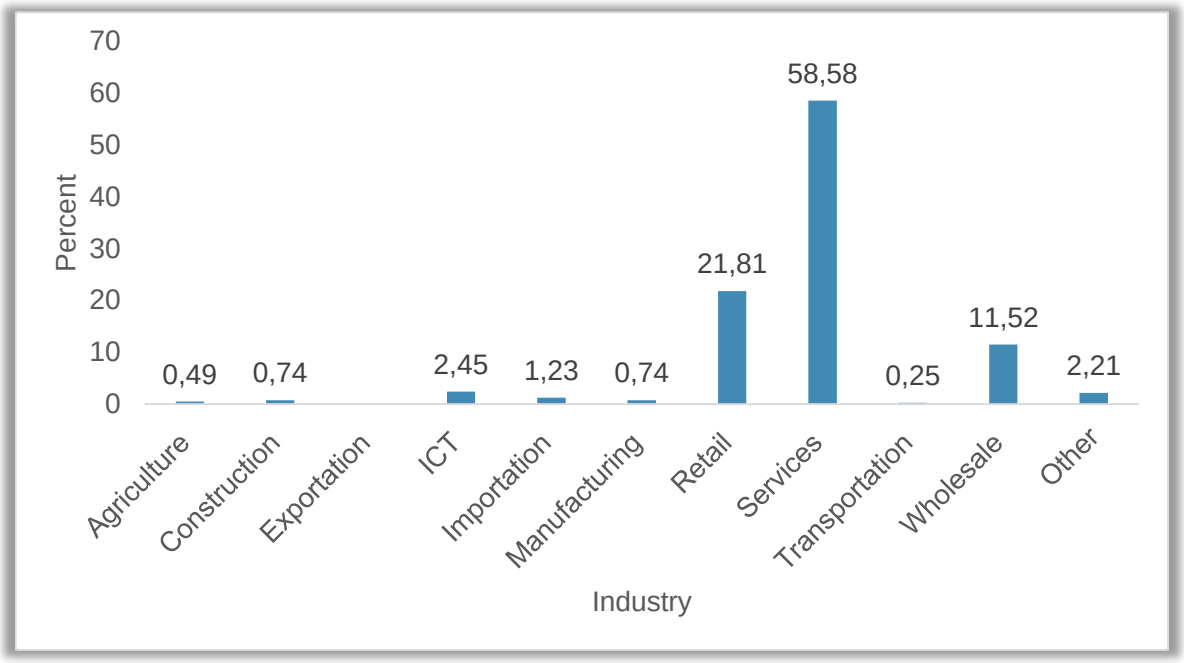

Figure 5.9: Industry

As the results indicated in Table 14 (Appendix B) and Figure 5.9 above, the majority 239 (58.58%) of women entrepreneurs running SMEs in Kigali did their business in the services industry. They might have chosen to do business in the services industry because many of these businesses required little start-up capital; for instance, MTN and AIRTEL services for sending and receiving money and hairdressing among others. The results are in line with the Global Entrepreneurship Monitor 2016/2017 Report on Women's Entrepreneurship (Kelley et al., 2017). What is interesting in this finding is that (16.93%) of the respondents penetrated the industries which were considered previously as mens' businesses. These included construction, ICT, importation, manufacturing, transportation, and wholesale industries (Kelley et al., 2017). The following section reveals the type of services rendered in Kigali.

5.2.15 Type of Service

The respondents who run service businesses were asked to state the services they provided. The objective of this question was to identify the business service women-owned SMEs in Kigali provided. Table 15 (Appendix B) shows the percentage distribution of types of service the respondents rendered. The table indicates that most of the businesses were selling (electricity, vegetables, drinking water, fruits, mobile phones, charcoal, and stationary) (17.7%), Airtel tigo + MTN (14.9%) and Food (e.g. restaurant) (14.05%). Figure 5.10 illustrates this more clearly.

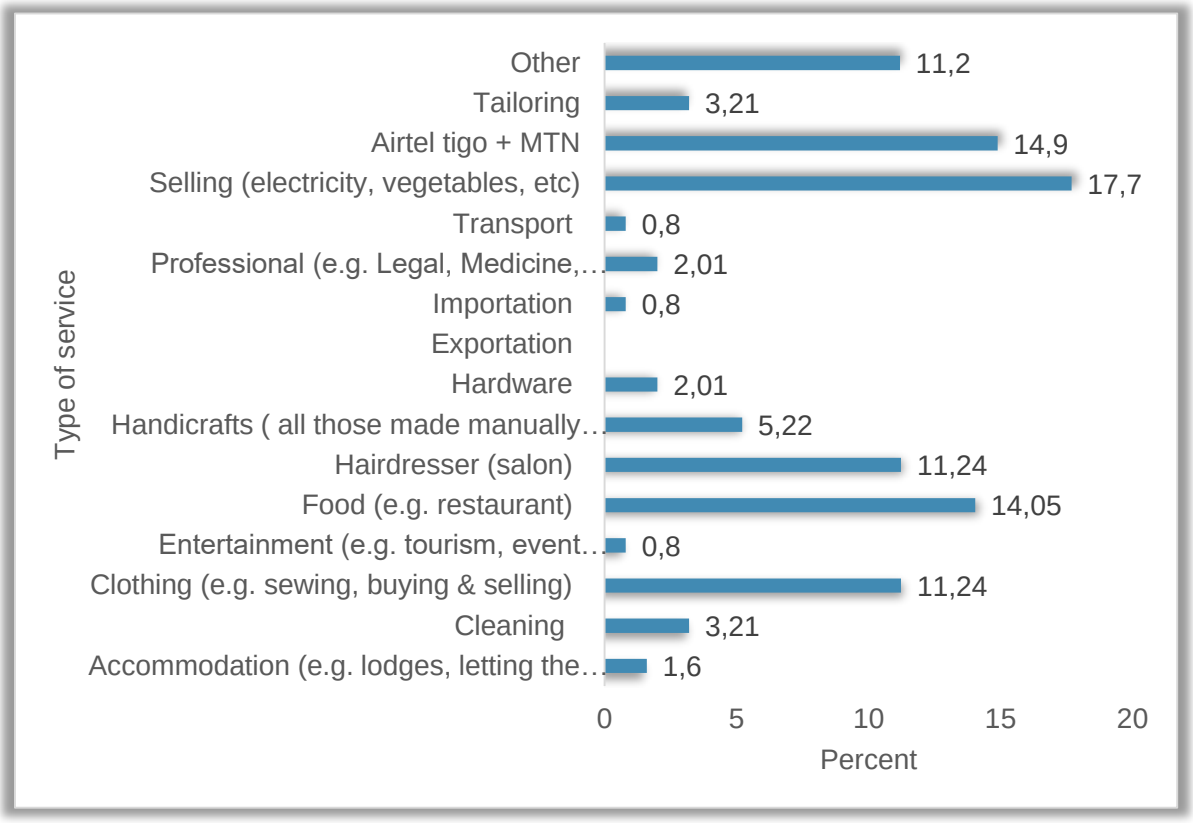

Figure 5.10: Type of service

5.2.16 Age of business existence

The question was “How long has your business been in operation”? The objective was to know the age of their businesses. Table 16 (Appendix B) and Figure 5.11 display the findings. The data indicated that for the businesses investigated in this study, the shortest time a business had been in operation was one (1) year, and this was for 24 businesses. The longest time was 42 years for one (1) business. Table 16 (Appendix B) and Figure 5.14 show that the majority of businesses had been in operation for between one (1) and five (5) years (54.5%).

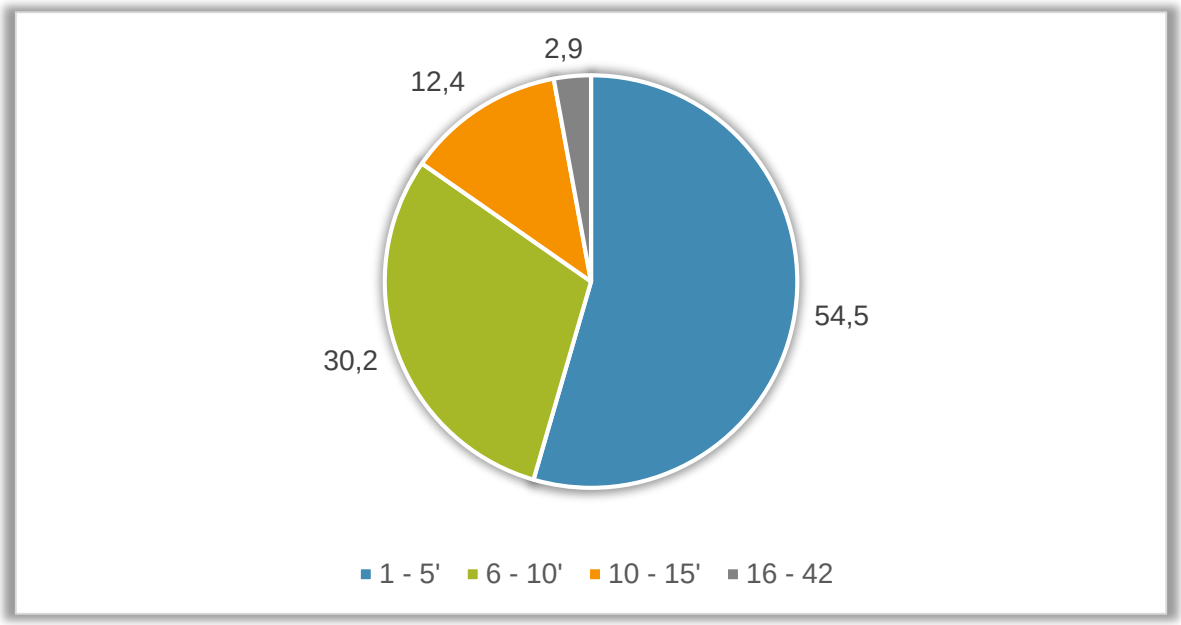

Figure 5.11: Age of business

5.2.17 Primary source of start-up capital

The question was “What is the source of money you used to start your business”? The objective of the question was to identify the sources of start-up capital women-owned enterprises used to start a business. Many options were allowed. Table 17 (Appendix B) shows the percentage distribution of the primary source utilised to open a business. As indicated in the table, in order of importance, husbands (23.9%), savings (23.4%) and bank (14.4%) were the primary sources of money. Figure 5.12 illustrates this more clearly.

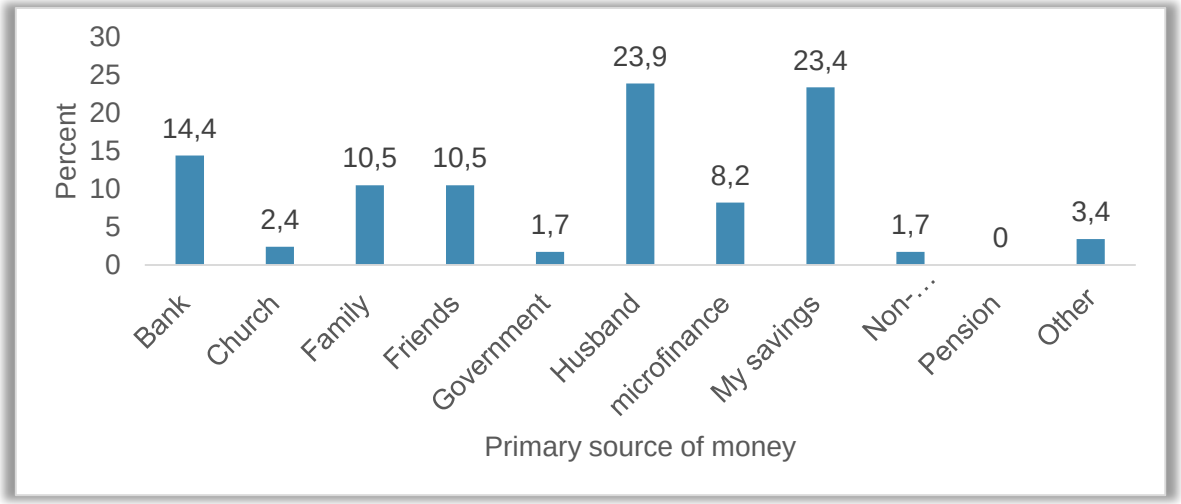

Figure 5.12: Primary source of money

Based on the findings indicated in Table 17 (Appendix B) and Figure 5.12 above, the majority 68.3% (N=508) of respondents obtained start-up capital respectively from the spouse (23.9%), savings (23.4%), family and friends (21%). It might be true that the financial institutions do not facilitate women entrepreneurs to access finance to enable them to start a business. They may work, perhaps for many years, saving money to realise their entrepreneurship dreams or looking around for financial assistance from a spouse, family, and friends (FinScope Rwanda, 2016). These results reflect those of Agbenyegah (2013) concerning the sources of start-up capital among women entrepreneurs in John Taolo Gaetsewe and Frances Baard District Municipalities of the Northern Cape Province in South Africa. The next section reveals the amount of start-up capital used to start a business.

5.2.18 Capital invested to start your business

The question was "How much capital did you use to start your business"? The objective of this question was to identify the amount of money the women entrepreneurs in Kigali used to start a business. The start-up capital is one of the indexes Rwanda uses to qualify the category of business in terms of micro-enterprise, small business, medium business, and large business. Table 18 (Appendix B) reveals the sum of money women-owned SMEs in Kigali invested in starting their businesses. As discussed above, One Rand = RwF 56.66 and One USD= RwF 950.98.

The table indicates that “RwF 500 000 - 15 500 000” (65.9%) and “Less RwF 500 000” (29.17%) were the capital that were mostly used to start a business. As can be seen in Table 18 (Appendix B), the majority 65.93 % (N=269) of respondents fall into the group of small business, while (29.17%) (N=119) were categorised as micro-enterprises. This finding is consistent with that of Rwanda. NISR (2018) states that women businesses are concentrated in micro and small businesses. Men entrepreneurs still control medium and large businesses with also dominance in micro and small businesses.

5.2.19 Number of workers including owner business

The question was “How many workers do you have including the owner”? The objective of the question was to identify the number of employees, including the owner who works for the business. The number of workers is another determinant Rwanda uses to qualify a business. Table 19 (Appendix B) indicates the number of employees, including the “boss” – the owner. A business with one person means that the owner works alone. The data indicated that a large number of businesses (118, 30.8%) had one worker. The highest numbers of workers used was 28 but for only one business. The table shows that most businesses (88.8%) had between one (1) and five (3) workers. Based on the findings, a large majority of (88.5%) (N=340) of respondents had one to three employees, including the owner. Referring to Table 1, which indicates the index to qualify a business into categories, it could be concluded that, in terms of the number of workers, women-owned SMEs in Kigali mostly fell in the micro-enterprise business category. The finding provides evidence that the majority of women-owned SMEs (88.8%, N=340) in Kigali run micro-enterprises. The finding is consistent with findings of past studies by Nsengimana et al. (2017) and Rwanda. NISR (2018) found that most women entrepreneurs in Kigali conducted their micro-enterprises with 1 to 3 employees. The following section reveals the turnover of respondents.

5.2.20 Annual income of respondents

The question was "What is your approximate annual income"? The reason for the question was to identify the annual income group of the respondents. Also, “annual income” is another index used to determine a business category for a SME in Rwanda. Table 20 (Appendix B) reveals the group of annual income each women-owned SMEs in Kigali belonged to. According to table, the majority of respondents had approximate annual incomes of “RwF 300 000 – 12 000 000” (94.9%).

Almost all respondents (94.9%, N=387) earned an annual income ranging between RwF 300 000 and 12 000 000 (See Table 1), which qualified their businesses into the small business category. However, these findings are somewhat disappointing, because this means that women-owned SMEs in Kigali make little annual income, and their businesses are of a small size (Rwanda. NISR, 2018). Despite the classification

of SMEs, the question raised here is, “how did women-owned SMEs in Kigali start their venture?”

5.2.21 The ways respondents started the business

The question was “How did you start the business”? The purpose of this question was to know how women entrepreneurs in Kigali started their businesses. The findings are presented in Table 21 (Appendix B). The table shows the percentage distribution of how the businesses were started. The table indicates, in order of importance, most of the businesses were started from scratch (58.5%), as a family business (22.7%) and as “bought out existing business” (10.6%). Figure 5.13 illustrates this more clearly.

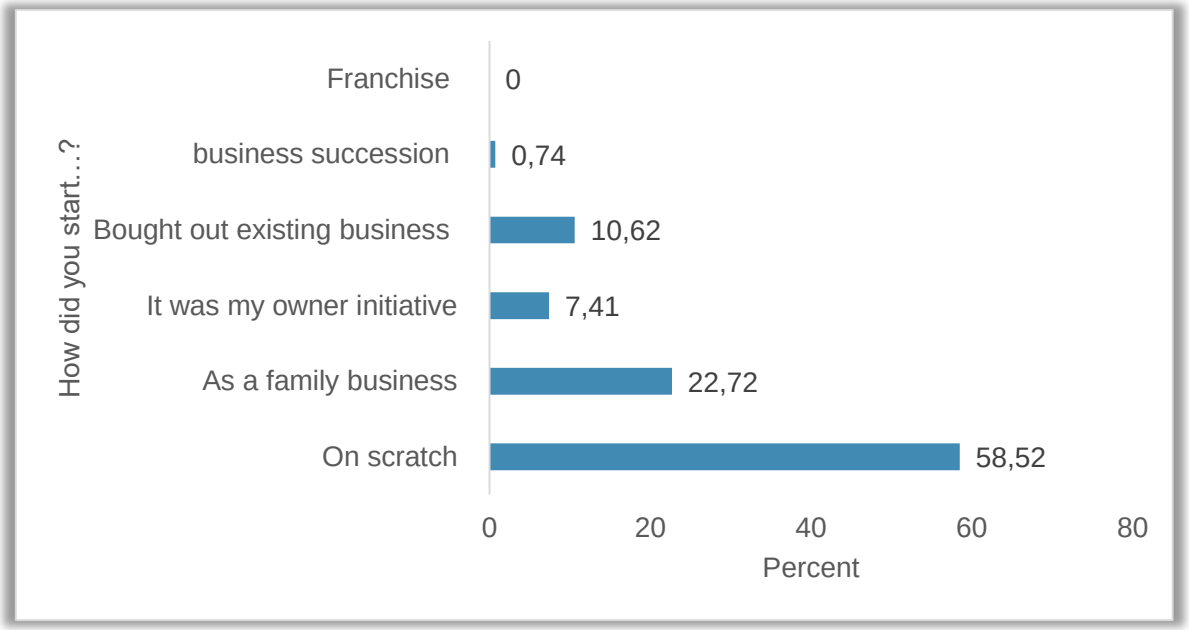

Figure 5.13: Type of business started

5.2.22 Business registered board

The question was “Where is your business registered"? The reason for the question was to identify where women-owned businesses are registered. Table 22 (Appendix B) and Figure 5.14 indicate that the majority of businesses were registered with Rwanda Revenue Authority (RRA) (72.4%).

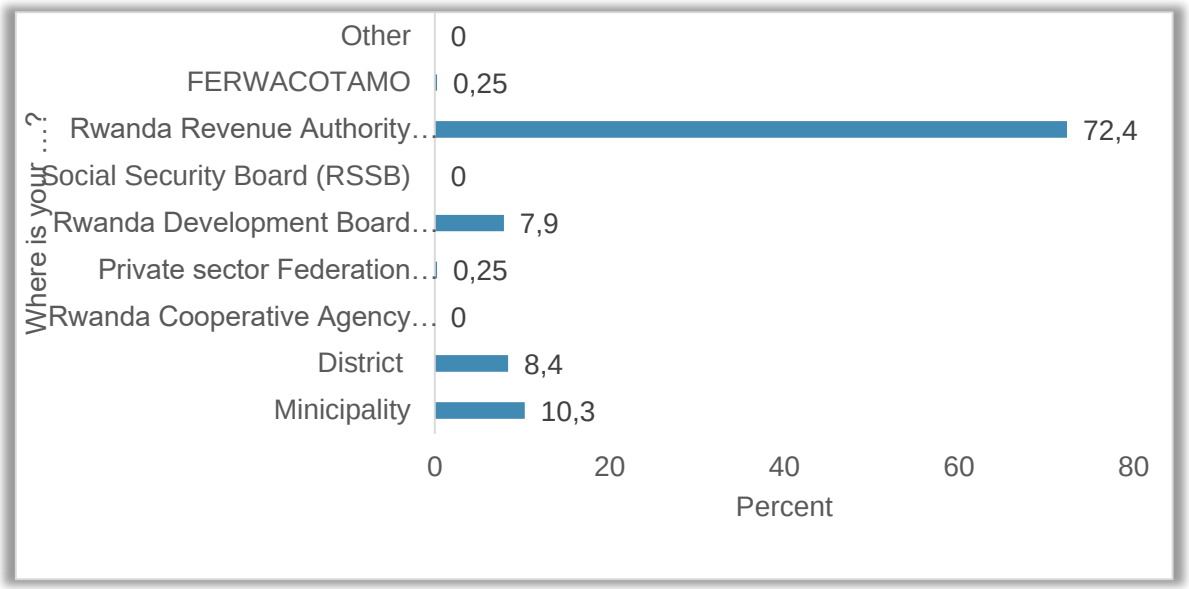

Figure 5.14: Business registeration board

5.2.23 Preferred consumers

The question was “What are your preferred consumers"? The objective of the question was to identify the favourite consumers of women entrepreneurs. Table 23 (Appendix B) indicates the favourite consumers for women-owned SMEs. For the majority of respondents, the preferred customers were “City of Kigali” (91.8%) as indicated in Table 23 (Appendix B) and Figure 5.15.

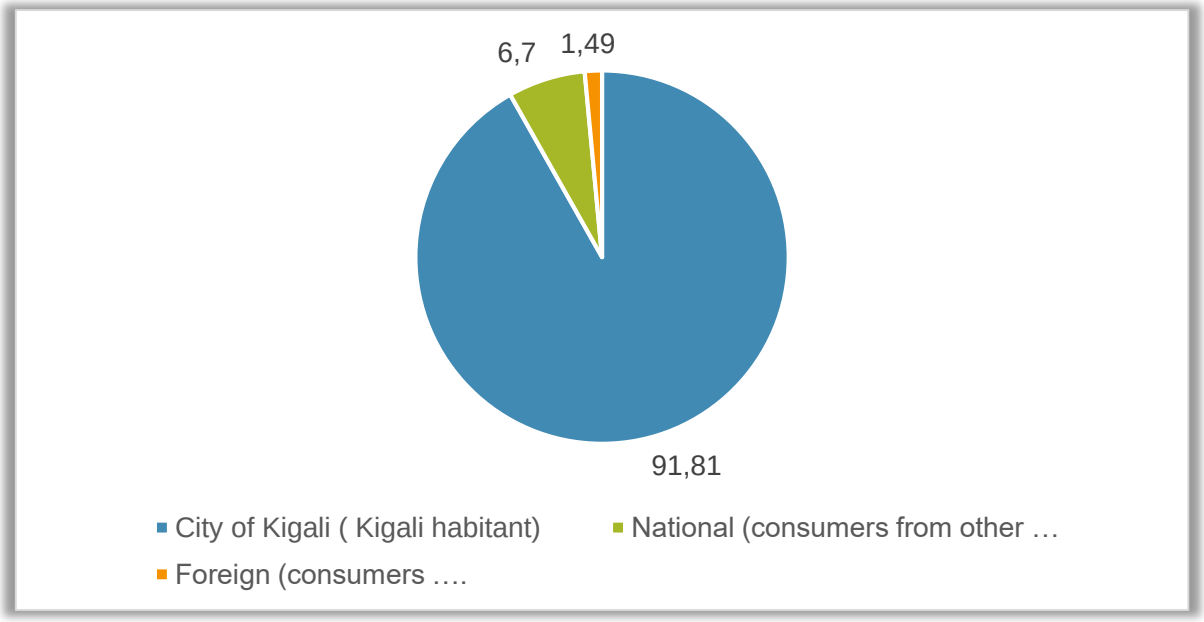

Figure 5.15: Preferred customers

5.2.24 Business shareholders

The question was “Do you have shareholders"? The objective of the question was to know if the business belongs only to a woman entrepreneur or whether it had shareholders. The findings are revealed in Table 24 (Appendix B). The table shows that most businesses did not have shareholders (98.16%).

5.2.25 Number of shareholders

The question was directed only to those women entrepreneurs who reported having shareholders. The objective of the question was to determine the number of shares each shareholder had. Table 25 (Appendix B) indicates that of those businesses that had shareholders, most of them had men (72.7%) as shareholders. The shares ranged between 25% and 100% with regards to men and women.

5.2.26 Current business status

The question was “What is the current status of your business"? The purpose of the question was to identify the actual business performance. The respondents stated their businesses’ positions. According to Table 26 (Appendix B) and Figure 5.16, the majority of businesses were growing (88.5%).

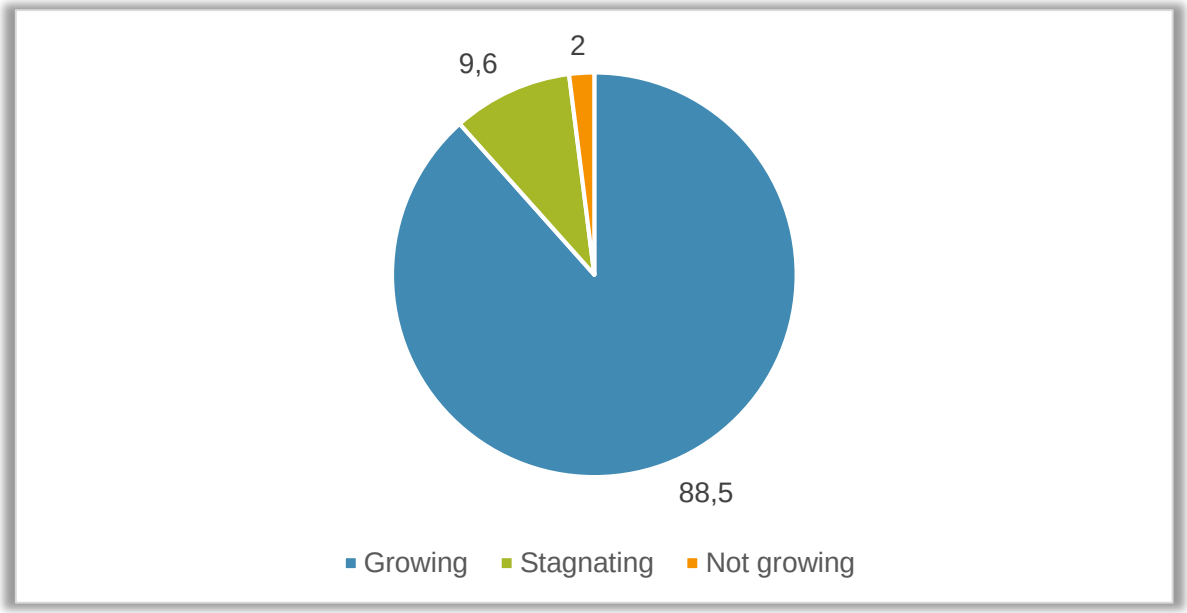

Figure 5.16: Current status of business

What is interesting in the findings in Table 26 (Appendix B) and Figure 5.16 is that 88.5% (N=361) of the surveyed SMEs were in the state of growing; they could compete and share markets with their male counterpart entrepreneurs. It was expected that their business categories moved forward to the next higher level that could increase the number of women-owned medium and large businesses. These results further support the idea of The New Times (2016) which observed that women entrepreneurs in Kigali had a bright future. They continued launching new enterprises, growing existing ones, and penetrating new business industries such as construction, transportation, and tech, which were dominated by men entrepreneurs. The next section indicates the area of business growth.

5.2.27 Area of business growth

The question was “If your business is growing, which areas is it growing in”? The objective of this question was to identify the areas in which women's SMEs in Kigali improved. Table 27 (Appendix B) indicates that the businesses were growing mostly in increasing benefits (27.4%), increasing incomes (21.9%) and increasing sales (14.3%). Figure 5.17 illustrates this more clearly.

Figure 5.17: Areas in which a business is growing

5.2.28 The reason business is not growing

The question was “If your business is not growing, why is it not growing”? The purpose for the question was to identify the reason why the businesses were not growing. The findings are revealed in Table 28 (Appendix B) and Figure 5.18. Most of the businesses were not growing because of taxes (20.3%), expensive rent (19.2%) and more competitors (18.0%).

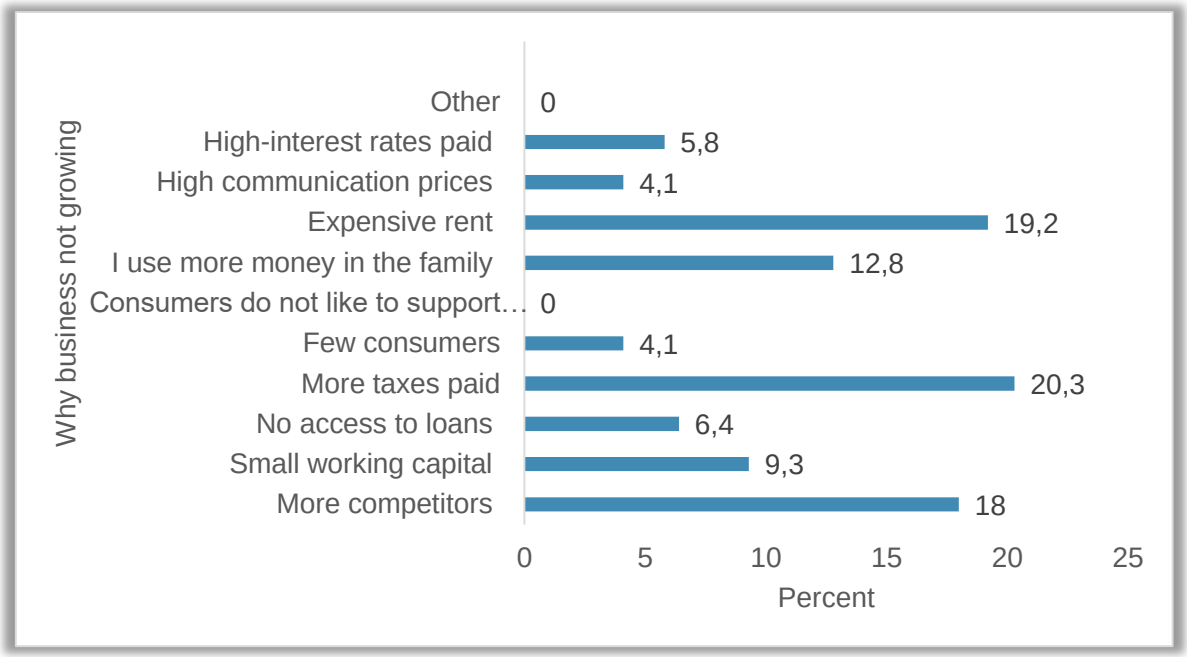

Figure 5.18: Why a business is not growing

5.2.29 Performance level of your business

The owners surveyed were asked to rate their business performance. The objective was to determine the performance level of the business. Table 29 (Appendix B) and Figure 5.19 indicate that the majority of businesses were performing very well (56.82%) or performing fairly (26.55%).

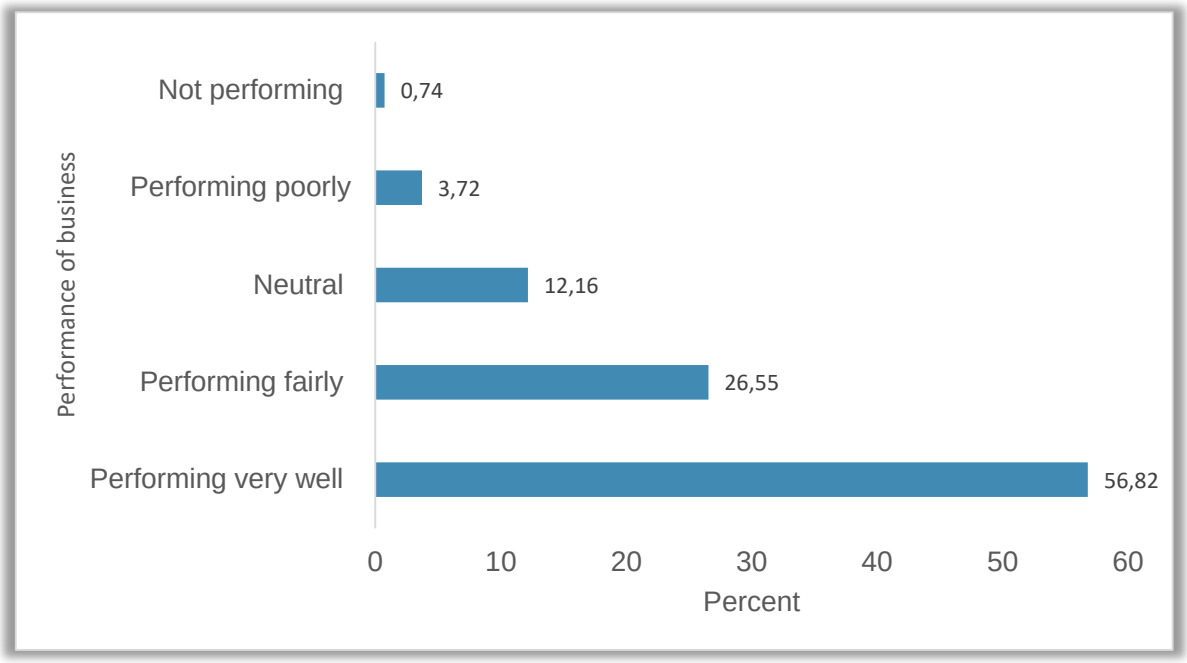

Figure 5.19: Performance of business

Based on the findings illustrated in Table 29 (Appendix B) and Figure 5.19, the majority (83.37%, N=336) agreed that their SMEs had a positive performance. This outcome is contrary to that of the WB (2019), who found that the performance of women businesses in Sub-Saharan Africa was worse. The United States of America. USAID (2009) stated that women entrepreneurs in Rwanda performed well in business; they improved their family's welfare and contributed to socio-economic development. Their businesses were successful, increasing the credibility that attracted government and Non-Government Organisation (NGO) as trusted stakeholders. The next findings concern the change the businesses brought to the owners of women-owned SMEs in Kigali.

5.2.30 Changes the business made among the surveyed SMEs

The question was “what changes did the business bring to you?” More than one option was allowed. The objective of this question was to identify the areas of life in which the women entrepreneurs improved. Table 30 (Appendix B) and Figure 5.20 show the percentage distribution of what changes the businesses brought. The change most of the businesses brought was “Respect in family and community” (21.5%). Others included “Improved lifestyle” (19.8%), “Recreation and leisure time” (19.1%).

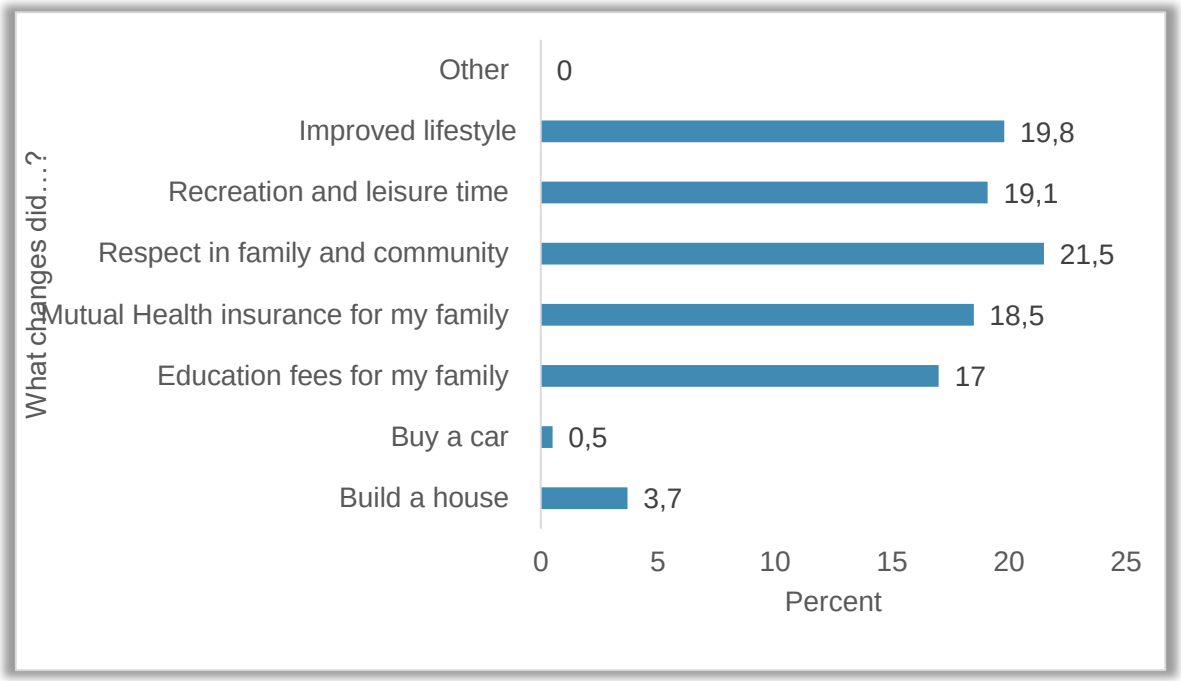

Figure 5.20: Changed businesses brought

The finding in Table 30 (Appendix B) and Figure 5.20 broadly supports the work of other studies which found that being a self-employed woman and running a successful business, increases respect and value in the family and the community. This actively contributes to community development; society benefits more from their business and recognises the importance of women entrepreneurs. It also decreases the gender-based violence (Nieman et al., 2003; Mahadea & Youngleson, 2013; Ndisanze, 2017). The next section discusses whether the respondents started their businesses with a written business plan.

5.2.31 Draw up a written business plan before starting an enterprise

The last question of section three was "When you started your business, did you draw up a written business plan?" This question aimed to determine the number of women entrepreneurs who drew up a business plan before starting a business. The findings are displayed in Table 31 (Appendix B) and Figure 5.21. The majority of respondents did not draw up a written business plan (61.5%) when they started their businesses.

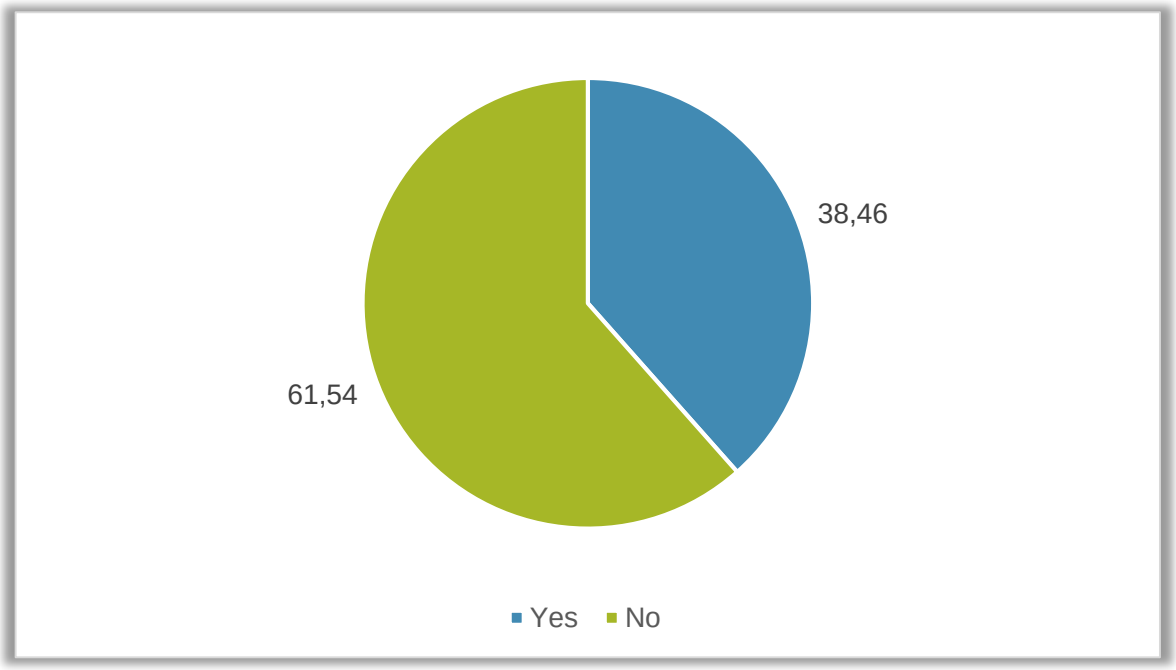

Figure 5.21: Business plan

SUMMARY OF THIS SECTION

To sum up, this section highlighted and presented the significant findings. Almost all the women entrepreneurs (97.1%) surveyed had one business. From the vast majority of the surveyed SMEs, (98.3%, N=400) were sole proprietorships, and (58.6%, N=240) provided services. Most of the businesses (54.5%, N=205) were between one and five years old. Many of women-owned SMEs (23.9%) in Kigali surveyed obtained start-up capital from their husbands. Over half (58.5%, N=267) of them reported that they started the businesses from scratch; while the considerable majority (91.8%, N=370) stated that their consumers were habitants of Kigali city.

Interestingly, the vast majority (88.5%, N=361) of women-owned SMEs in Kigali performed well, and the businesses made a considerable socio-economic change in the families of the owners, in terms of respect, decreased gender-based violence, while promoting gender equality. The next section presents the results on the reason for starting their businesses.

SECTION 4: REASONS FOR STARTING A BUSINESS

The previous section focused on business profile. In this section, four of the questionnaire (see Appendix A) answers the first research question "What are the socio-economic factors influencing women in Kigali, Rwanda to join entrepreneurship"? The objective of this question was to identify the socio-economic factors that influence women in Kigali, Rwanda to join entrepreneurship. This section also answers the two questions 32 and 33 on the questionnaire (See Appendix A). The next section identifies the motives for women entrepreneurs to start businesses in Kigali.

5.2.32 Main reasons to start business

The question was "What was the main reason you started your business"? The objective of the question was to identify the main reasons why the women entrepreneurs were motivated to start businesses in Kigali. These reasons could be push factors that motivate an entrepreneur to start a necessity enterprise or pull factors that drive an entrepreneur to launch an opportunity enterprise. Table 32 (Appendix B) provides the statistics of different motives which pushed or pulled women in Kigali to enrol into entrepreneurship. Table 32 (Appendix B) shows the percentage distribution of the reasons why the respondents started their businesses. The majority of respondents started their businesses because they were unemployed (57.4%). Other reasons were: “I needed time to care for my family while generating income” (7.1%) and self-actualisation (6.1%).

As indicated in Table 32 (Appendix B), this study found that the majority (57.4%, N=234) of the respondents started businesses due to the unemployment. A possible explanation for this might be that they were pushed to start businesses to generate income to satisfy their needs since they could not secure employment. They did not have an entrepreneurs’ intention. Those educated, could close their businesses anytime whenever they would find employment in the public or private sector.

Referring to Table 32 (Appendix B), women-owned SMEs in Kigali can be categorised into two groups, that is, necessity (76%, N=310) and opportunity (24%, N=98) entrepreneurs. Necessity entrepreneurs included those that were unemployment;

experienced termination of the contract; were not educated to seek employment; experienced maltreatment in the workplace; experienced job dissatisfaction; experienced divorce or separation, death of husband, and refugee. These women were desperate and they did not have sources of income, or were unhappy at their place of work and they decided to start a business to survive. Despite their decision to launch businesses, they struggled to find start-up capital.

Several reports have shown that, often, necessity entrepreneurs are unemployed, looking to survive. The poverty situation pushes them to start small-sized businesses with little start-up capital borrowed from family or friends. They run a business alone, and their income is normally lower compared to that of opportunity entrepreneurs (Donna et al., 2011; Fairlie & Fossen, 2017).

By contrast, opportunity entrepreneurs, referring to Table 32 (Appendix B), are those who challenge men by showing them that women can also start and run a successful businesses. Furthermore, they have education, training and experience; entrepreneur intention; needed time to care for the family while generating income; needed to generate more revenue; independence; innovation, and self-actualisation. Opportunity entrepreneurs socio-economic situations are stable. They start businesses to grow financially and they fulfil their business ambitions with a spirit of dominance, influence in the community and increased visibility. They identify an opportunity, take advantage of the opportunity and they launch or start businesses. They also do not have a problem to secure start-up capital compared to necessity entrepreneurs (Donna et al., 2011; Nieuwenhuizen & Nieman, 2014; Fairlie & Fossen, 2017). The following section reveals whether female entrepreneurs in Kigali requested permission to launch enterprises.

5.2.33 Request for permission to start a business

The question was “Did you ask for permission from your husband or family to start a business? The reason for the question was to determine if the respondents requested permission from their husbands or family before starting a business. Table 33 (Appendix B) indicates whether the owners of women-owned SMEs in Kigali asked for permission from their husbands or family to start businesses.

According to the table, most respondents asked for permission from their husbands (56.2%), who were supportive. Seventy-seven (77) (19.1%) did not ask for permission. Based on the results as evident in Table 33 (Appendix B), one interesting finding is that the majority (72.5%, N=293) of the surveyed owners of women-owned SMEs in Kigali respectively, were married and living with their husbands (56.2%, N=227) and single females (10.1%, N=41) requested for permission from their families to launch their businesses; and for (6.2%, N=25) of them, it was their husbands' proposition to start the businesses.

All of the respondents received full support from their husbands and families. This is in accordance with the present results, previous studies of Vossenberg (2013), and Wolf and Frese (2018) demonstrated that husbands and families' physical, psychological, and resources support females' businesses and motivate them, which affects their business performance and growth.

SUMMARY OF THIS SECTION

In summary, these results showed that unemployment (57.4%) was the main reason that pushed women in Kigali to start necessity businesses. Entrepreneurs can be classified in two categories, necessity and opportunity entrepreneurs and the majority of women-owned SMEs in Kigali fall into necessity entrepreneurs (76%, N=310) versus opportunity entrepreneurs (24%, N=98). Furthermore, (72.5%, N=293) of them received permission and support from their husbands and families to start their businesses. The next section is concerned with the constraints faced by women entrepreneurs in Kigali.

SECTION 5: CONSTRAINTS FACING WOMEN-OWNED SMALL AND MEDIUM ENTERPRISES IN KIGALI

The previous sections focused on the socio-economic factors influencing women in Kigali, Rwanda to join entrepreneurship. This section responded to the second research question “What are the constraints experiencing women entrepreneurs in running SMEs in Kigali, Rwanda?” The objective of this question was to identify the constraints experienced by women entrepreneurs when running SMEs in Kigali, Rwanda. The questions in this fifth section started from the 34th to the 59th question in the questionnaire (see Appendix A). However, the constraints were divided into five groups (Table 34 - Appendix B), that is, gender inequality, financial, government, skills, and own constraints. The questions were in the form of Likert scale, 1 strongly disagree, to 5 strongly agree.

The respondents were asked to rate each statement. The quantitative method was adopted to gather survey data from a sample of 409 women-owned SMEs in Kigali. SPSS was used to calculate the descriptive statistics in terms of percentages of each variable. Thereafter, T-test analysis was done and the results were presented in terms of the mean, standard deviation, t-value, and hypothesis results (Table 34 - Appendix B). The details of how the data was analysed are presented and discussed as follows. This section tends to answer the second research question “What are the constraints experienced by women entrepreneurs in running small and medium businesses in Kigali, Rwanda”?

T-TEST

For this section**,** the t distribution was used to compare the mean scores on the Likert scale with the neutral score of 3 which was the mid-point between disagree and agree by applying the one-sample t test.

$$T = \frac{\overline{X} - \mu}{S/\sqrt{n}}$$

Where $\overline{X}$ is the mean score, μ is the assumed mean value (in this case, it equals to 2.5), *S* is the standard deviation of the scores, *Xi's* (where i = 1, 2, …, *n*) and *n* is the sample size.

This was done by testing the following null hypothesis:

H_0: The mean score of a particular variable is equal to 3.

H_1: The mean score of a particular variable is less than 3 or more than 3.

If the variance between the two scores is statistically meaningful from 0, the null hypothesis that the mean score is equivalent to 3 will be dismissed (rejected), and the alternative hypothesis that the mean score of the variable is less than 3 (if the mean score is less than 3) or that the mean score of the variable is greater than 3 (if it is more than 3) will be adopted (accepted). This would mean that the respondents either disagreed with the statement or agreed with the statement.

In contrast, if the gap were not important, we would not dismiss the null hypothesis. This means that the respondents were either neutral or undecided with the argument. The level of significance used was 0.05. As an example, for question 34, the mean score was 1.46 (which was less than 3), and the t-test analysis provides t = -57,458 (p=.000<.05). The null hypothesis is that the mean score = 3 was dismissed since the P-value (0.000) for the t-value of-57,458 was lower than 0, 05, the degree of importance, and the alternative hypothesis that the mean score was lower than 3 was accepted. This implied that the respondents disagreed with the statement that "there is gender inequality in business". Table 34 (Appendix B) presents the mean scores of the different statements as well as the independent t test results.

Table 34 (Appendix B) includes statements on gender inequality, financial constraints, government constraints, skills constraints and own fear. The majority of respondents disagreed with all the statements of gender inequality, except, "Inability to travel because of family or husband obligations" (31.3% for Disagree vs 42.3% for Agree). This is evidenced by the t-test results. For example, for "There is gender inequality in business", 98.52% (58.37% + 40.15%) disagreed whereas only 0.25% agreed. Also, the t-test results indicated that the respondents disagreed with all of them. Of the three

statements of financial constraints, it was only “Short term to pay back the loan is a constraint” (39.11% for disagree vs 41.09%) which the respondents agreed with. However, the t-test results indicates that the respondents were neutral. The respondents agreed with all Government constraints except “Lack of a support network is a constraint”, which they disagreed with. The respondents agreed with all skills constraints and own fear. Seemingly, the most important constraints according to the magnitude of the t-values, are as follows: Access to government service, high taxes, lack of market opportunities, inability to obtain public tender, lack of education and training, lack of entrepreneurial skills, lack of business experience, lack of information technology skills (e.g. Internet), and HIV/AIDS. The discussion concerning each question follows below by starting with the gender inequality constraints group. This group contained the following questions and items: there is gender disparity in business, being a woman is a negative factor in business, customs and local culture disadvantage women to operate a business, it is difficult for women to access finance, inability to travel because of family or husband obligations, and sexual harassment is a constraint. The next section begins with a discussion of women’s views on gender inequality in business.

GENDER INEQUALITY CONSTRAINTS

5.2.34 Gender disparity in business constraint

The respondents were asked to rate the statement "There is gender inequality in business". The objective of this statement was to determine whether gender inequality in business was a constraint experienced by women entrepreneurs when running SMEs in Kigali. The t-test results are shown in Table 34 (Appendix B).

Referring to Table 34 (Appendix B), question 34, the mean score was 1.46 (which was less than 3), and the t-test analysis provided at value = -57.458 (p=.000<.05). The null hypothesis that the average mean score = 3 was rejected because the P-value (0.000) for the t value of -57.458 was lower than 0.05, the level of importance, and the alternative hypothesis that the mean score was lower than 3 was accepted. This implied that the respondents disagreed with the statement that “there is gender inequality in business”. Also, Table 34 (Appendix B), question 34 shows that almost all

(98.52%) the respondents disagreed with the statement which means that gender inequality is not a constraint facing women-owned SMEs in Kigali. After the 1994 genocide, women made up about (70%) of the population of Rwanda. They had to raise children, recover their economic situations and contributed to the rebuilding of the country. Some of them started businesses as a means of survival for their families. Genocide changed the business landscape in Rwanda. Gender is no longer an issue in doing business in Kigali, the capital city of Rwanda (International Finance Corporation, 2008; United States of America. USAID, 2009; Essa, 2018). Besides this, the government of Rwanda amended the constitution and reinforced the law to promote gender equality in all spheres of activities in the country. The population complied with the law and promoted gender equality even in business (Rwanda. Ministry of Gender and Family Promotion. 2010; Rwanda. 2015).

5.2.35 Being a woman in business constraint

The researcher collected opinions of respondents on the statement "Being a woman is a negative factor in business". The objective was to determine whether being a woman was a constraint experienced by women entrepreneurs when running SMEs in Kigali. As presented in Table 34 (Appendix B), question 35, the mean score was 1.44 (which was lower than 3), and the t test analysis made a t value = -48.639 ($p=.000<.05$). The null hypothesis that the mean score = 3 was dismissed because the P – value (0.000) for the t value of -48.639 was lower than 0.05, the level of importance, and the alternative hypothesis that the mean score was less than 3 was accepted.

This explains that the respondents disagreed with the statement that being a woman is a negative factor in business. Based on this result, being a woman is not a constraint faced by women entrepreneurs in Kigali. The same Table 34 (Appendix B), question 35 indicates that 93.38% of the respondents enjoyed gender equality in doing business in Kigali. The next findings discuss whether customs and local culture disadvantage women in business.

5.2.36 Customs and local culture constraint

The statement was “Customs and local culture disadvantage women to operate a business” the objective was to identify whether customs and local culture were constraints for women entrepreneurs to operate a business in Kigali. T-test statistics presented findings in Table 34, question 36. Table 34 (Appendix B) indicates that the mean score was 1.68 (which was lower than 3), and the t test analysis gave a t value = -30.382 (p=.000<.05). The null hypothesis that the average mean score = 3 was rejected due the P – value (0.000) for the t value of -30.382 was lower than 0.05, the level of significance, and the substitute hypothesis that the mean score was lower than 3 was accepted. This suggests that the surveyed disagreed with the statement customs and local culture disadvantage women to operate a business.

Referring to the frequency in Table 34 (Appendix B), question 36 indicates that 84.31% of those who responded to this item felt that customs and local culture do not constitute constraints that disadvantage women to operate businesses in Kigali. This result may be explained by the fact that women entrepreneurship in Rwanda has a strong voice and campaign support from the president of the republic and other notable stakeholders like RCWE, PSF, and HeforShe (Kantengwa, 2016). The following results concerns access to finance.

5.2.37 Access to finance constraint

The statement was “It is difficult for women to access finance" and the objective of the statement was to determine if access to finance was a constraint experienced by women entrepreneurs in running SMEs in Kigali. Table 34 (Appendix B), question 37 illustrates that the mean score was 1.92 (which was lower than 3), and the t test analysis provided a t value -22.378 (p=.000<.05). The null hypothesis that the average mean score = 3 was dismissed due to the P-value (0.000) for the t value of -22.378 was lower than 0.05, the level of importance, and the alternative hypothesis that the mean score was lower than 3 was accepted. This means that the surveyed disagreed with the statement "It is difficult for women to access finance". Furthermore, 74.2% of respondents stated that it was not difficult for them to access finance. Therefore, access to finance was not a constraint faced by women-owned SMEs in Kigali. These

findings contradict those of Flaherty (2017), who emphasised the difficulties of women entrepreneurs in Kigali to access to capital to launch and grow their businesses.

5.2.38 Inability to travel constraint

The statement was "inability to travel because of family or husband obligations is a constraint". The reason for the statement was to determine whether the inability to travel because of husband or family was a constraint experienced by women entrepreneurs in running SMEs in Kigali. Table 34 (Appendix B), question 38 indicates opinions of respondents on the statement.

Table 34 (Appendix B) illustrates that the mean score was 3.08 (which was slightly more than 3), and the t test analysis provided a t value 1.172 (p=.000<.05). The null hypothesis that the average mean score = 3 did not rejected because the P – value (0.000) for the t value of 1.172 was closer to than 0.05, the level of significance, and the mean score 3.08 was slightly more than 3. Therefore, the null hypothesis was not dismissed. This means that women-owned SMEs surveyed in Kigali views were neutral with the statement that an inability to travel because of family or husband obligations was a constraint. Referring to the percentage as indicated in Table 34 (Appendix B), (31.3%) of respondents agreed, versus 43.3% disagreed, and 26.41% were neutral. The results indicate divided opinions among the respondents on the statement that inability to travel because of family or husband obligations was a constraint to women-owned SMEs in Kigali. The most remarkable result from the data is that (31.3%) of women-owned SMEs in Kigali can travel freely. Husbands or families understand the benefit from physical mobility to meet networks, training and buy stock, among others. It seems that these women entrepreneurs received support from husbands or families, which increased their awareness and trust. They were well-positioned and compete in the Kigali market.

Besides this, there is an improvement towards gender equality; husbands or families release women to travel alone which was not allowed previously in Rwandan society (Kantengwa, 2016; Mukamana et al., 2017). What is disappointing in these results is that (43.3%) of women-owned SMEs in Kigali were not free to travel while running their business. Their husbands or families ban them from traveling and this makes their business less competitive.

This finding is consistent with that of (UNCTAD, 2014; United States of America. USAID, 2015; Mukamana et al., 2017). The unexpectedly high level of neutral responses 26.41% (N=106) is undoubtedly due to cultural norms which prohibit women from criticising the families they married into. In traditional marriage, a woman marries a family; her husband represents her in his family. This means that a member of the husband's family feels free to express his perception and opinion toward that woman even if it concerns her private life (Mukashema & Sapsford, 2013). The next section reveals whether sexual harassment is a constraint to women-owned businesses in Kigali.

5.2.39 Sexual harassment constraint

The statement was "Sexual harassment is a constraint". The objective of the statement was to establish if sexual harassment was a constraint experienced by women entrepreneurs in running SMEs in Kigali. Their opinions on this statement is displayed in Table 34 (Appendix B).

Table 34 (Appendix B), question 39 illustrates that the mean score was 2.78 (which was lower than 3), and the t test analysis gave a t value -2.898 ($p=.000<.05$). The null hypothesis that the average mean score = 3 was rejected because the P – value (0.000) for the t value of -2.898 was lower than 0.05, the level of significance, and therefore alternative hypothesis that the mean score was lower than 3 was accepted. It indicates that the majority of respondents disagreed with the statement “Sexual harassment is a constraint". Referring to Table 34 (Appendix B), the majority (43.6%) of women-owned SMEs in Kigali did not experience any form of sexual harassment. They run their businesses correctly, receive the services they deserve, free of sexual harassment. However, (31.04%) of respondents reported that sexual harassment was a constraint for them in running businesses in Kigali. It is not surprising that (25.37%) of women-owned SMEs in Kigali remained neutral as discussing things related to sexual harassment is perceived as a taboo in Rwanda. The next section discusses the results related to financial constraint.

FINANCIAL CONSTRAINTS

Financial constraints include high-interest rates, short term to pay back the loan, and collateral to obtain a loan constraint. Each item is discussed independently starting with high-interest rates.

5.2.40 High-interest rate is a constraint

The statement was “High-interest rate is a constraint" and the purpose of the statement was to determine whether high-interest rates was a constraint experienced by women entrepreneurs in running SMEs in Kigali. Table 34 (Appendix B), question 40 presents the T-test statistics of the view of women-owned SMEs in Kigali. Table 34 (Appendix B) shows that the mean score was 2.82 (which was lower than 3), and the t test analysis provided a t value -2.508 ($p=.000<.05$). Thus, the null hypothesis that the mean score = 3 was dismissed due to the P – value (0.000) for the t value of -2.508 was lower than 0.05, the degree of significance, and the alternative hypothesis that the mean score was less than 3 was accepted.

This indicates that the respondents disagreed with the statement that High-interest rates is a constraint. The results are also confirmed in Table 34 where the majority 40.15% of women-owned SMEs in Kigali stated that high-interest rate was not a constraint for them in running SMEs in Kigali, followed with (30.79%) of neutral responses. At the same time, (29.06%) of women-owned SMEs in Kigali agreed with the statement that the high-interest rate was a constraint for them.

These findings disagreed with those of Rwirahira (2018) and Ruhara et al. (2018) who reported that high-interest rates challenge women entrepreneurs in Kigali to start-up and grow business. It is one of the factors that result in the closure of women businesses. The following results indicate whether the short terms granted to pay back loans is a constraint to women-owned businesses.

5.2.41 Short term to pay back the loan

The statement was “short term to pay back the loan is a constraint". The objective of the statement was to identify if the short term to pay back loans was a constraint experienced by women entrepreneur in running SMEs in Kigali.

Table 34 (Appendix B), question 41 indicates whether the short term to pay back the loan was a constraint. Table 34 (Appendix B) shows that the mean score was 2.97 (which was slightly lower 3), and the t test analysis gave a t value 0.328 (p=.000<.05). The null hypothesis that the mean score = 3 failure to rejected null hypothesis because the P – value (0.000) for the t value of 0.328 was closer to 0.05, the degree of importance, and the null hypothesis was not rejected because the mean score was slightly lower to 3. This means that the respondents were neutral on the statement “short term to pay back the loan was a constraint”.

The results presented in Table 34 (Appendix B), question 41 also indicates that most of the respondents, (41.09%) agreed with the statement that short term to pay back the loan was a constraint for women-owned SMEs in Kigali. Meanwhile, (39.11%) disagreed with the statement that the short term to pay back the loan was a constraint for them. However, around a quarter, (19.80%) of respondents did not disagree or agree; they remained neutral. According to the results, responses are very close, with (41.09%) agreeing versus (39.11%) disagreeing with a difference of (1.98%) in favour of agreeing. Therefore, there were mixed opinions (agree and disagree) on the statement that the short term to pay back the loan was a constraint for women-owned SMEs in Kigali. The next discussion addresses womens’ views on collateral to obtain loans.

5.2.42 Collateral to obtain a loan

The statement was “Collateral to obtain a loan is a constraint”. The purpose of the statement was to determine if collateral to obtain a loan was a constraint experienced by women entrepreneurs in running SMEs in Kigali. Findings presented in Table 34 (Appendix B), question 42 indicates the views of respondents on whether collateral to obtain a loan was a constraint. Table 34 (Appendix B) indicates that the mean score obtained was 2.75 (which was lower than 3), and the t test analysis made a t value = -

3.931(p=.000<.05). Hence, the null hypothesis that the average mean score = 3 was rejected because the P – value (0.000) for the t value of -3.931 was lower than 0.05, the level of importance, and the substitute hypothesis that the mean score was lower than 3 was accepted.

This means that the women-owned SMEs in Kigali surveyed disagreed with the statement that collateral to obtain a loan was a constraint facing women entrepreneurs in running SMEs in Kigali, Rwanda. The same Table 34 (Appendix B) indicates that the majority (42.33%) disagreed with the statement that collateral to obtain a loan was a constraint. This was followed with (37.62%) agreeing and a minority (20.01%) of respondents were neutral.

Table 33 reported that (72.5%) of women and girls received permission and support from husbands or families to start a business. Furthermore, it could be explained that the support was not only limited to permission to start businesses; it also extended to help them to obtain guarantees from husbands or families to secure loans from the lenders. The next section discusses the results regarding government constraints facing women entrepreneurs in running businesses in Kigali.

5.2.43 Government constraints

The government constraints include lack of a support network, access to government service, business registration, high taxes, lack of market opportunities, bribery of government officials, inability to obtain public tenders, high transport cost, high communication cost, and lack of incubator centre. Each item is discussed below.

5.2.43 Lack of a support network

The statement was "Lack of a support network is a constraint" and the objective of the statement was to determine if lack of a support network was a constraint experienced by women entrepreneurs in running SMEs in Kigali. The results presented in Table 34 (Appendix B) shows the perception of women-owned SMEs surveyed in Kigali on whether the lack of a support network was a constraint to them during their business activities.

As can be seen in Table 34 (Appendix B), question 43, the mean score was 2.37 (which was lower than 3), and the t-test analysis provided at value = -9.221 (p=.000<.05). The null hypothesis that the mean score = 3 was dismissed due to the P-value (0.000) for the t value of -9.221 was below 0.05, the degree of significance and the substitute hypothesis that the mean score was lower than 3 was accepted. This indicates that the respondents disagreed with the statement that lack of a support network is a constraint faced by women entrepreneurs in running businesses in Kigali.

It was also confirmed in the same Table 34 (Appendix B), question 43 that the majority of respondents (62.1%) perceived that lack of a support network was not a constraint facing women entrepreneurs in running businesses in Kigali. Therefore, women-owned SMEs in Kigali could freely network with, for instance, supplies, consumers, government, and other stakeholders. The next discussion concerns access to government services.

5.2.44 Access to government service

The statement was “Access to government service is a constraint" and the reason for the statement was to identify whether access to government services was a constraint experienced by women entrepreneurs in running SMEs in Kigali. The results of this item is presented in Table 34 (Appendix B), question 44. Women-owned SMEs in Kigali expressed their views on access to government service being a constraint. Table 34 (Appendix B) displays the results, the mean score was 3.78 (more than 3) and the t-test analysis provided t = 16.077 (p=.000<.05). The null hypothesis that the mean score = 3 was dismissed because the P-value (0.000) for the t-value of 16,077 was more than 0.05, the degree of importance, and the alternative hypothesis that the mean score was greater than 3 was adopted. These findings mean that the respondents agreed with the statement that access to government services was a constraint experienced by women entrepreneurs.

When asked whether access to government service was a constraint, (72.24%) of the respondents agreed with the statement as displayed in Table 34 (Appendix B), question 44. This confirms the t value results in the paragraph above. Furthermore, (16.22%) of the respondents were neutral and (11.55%) of the surveyed women disagreed with the statement. However, these results were not encouraging as the

majority of respondents, (72.24%) experienced challenges to access government services. A possible explanation for these results may be the lack of adequate skills in ICT as many government services are provided online, for instance, business registration, paying taxes, and public procurement application. As indicated in Table 4 (Appendix B), (76.9%) of respondents had secondary education and less. Many secondary schools do not have computer literacy programmes, and therefore they do not have ICT skills to use the Internet of things and computer to access government services. WB (2019) reported the lack of ICT skills among Rwandan entrepreneurs. The next section discusses business registration.

5.2.45 Business registration

The statement was “Business registration is a constraint” and the purpose of the statement was to identify if business registration was a constraint experienced by women entrepreneurs in running SMEs in Kigali. Table 34 (Appendix B), question 45 provides T-test statistics of surveyed views on the statement. The mean score was 3.46 (more than 3) and the t-test analysis provided t = 8.447(p=.000<.05). The null hypothesis that the mean score = 3 was dismissed because the P-value (0.000) for the t-value of 8.447 was greater than 0.05, the degree of significance, and the substitute hypothesis with mean score was greater than 3 was adopted. This implies that the respondents agreed with the statement that business registration was a constraint facing women entrepreneurs in running businesses in Kigali.

The percentage in Table 34 (Appendix B), question 45 agreed with the t value on the results. More than half (57.5%) of surveyed agreed with the statement versus (25.31%) of respondents disagreed with the statement, while (17.20%) of respondents were neutral. Referring to Table 4 (Appendix B), (76.9%) of women-owned SMEs in Kigali had secondary schooling level and less and therefore did not have computer literacy skills to register their businesses. In Rwanda, business registration is done online and women rely on agencies which costs them money. This study shares similarities with that of WB (2019), who found that many Rwandan entrepreneurs struggle to comply with digitalised government services. The following section discusses high taxes constraint.

5.2.46 High tax constraints

The statement was "High taxes are a constraint" and the reason for the statement was to determine if high taxes was a constraint experienced by women entrepreneurs in running SMEs in Kigali. The findings of this statement show the views of women-owned SMEs in Kigali on taxes and Table 34 (Appendix B) presents the results.

Table 34 (Appendix B), question 46 demonstrates that the mean score was 3.77 (more than 3) and the t-test analysis generated t = 17.817 (p=.000<.05). The null hypothesis that the mean score = 3 was dismissed because the P-value (0.000) for the t-value of 17.817 was more than 0.05, the degree of importance, and the alternative hypothesis that the mean score was greater than 3 was adopted. These findings conclude that women-owned SMEs in Kigali agreed with the statement that high taxes were a constraint facing women entrepreneurs in running businesses in Kigali.

Considering the percentage figures in the same Table 34 (Appendix B), question 46; the findings indicate that (68.71%) of respondents agreed with the statement that high taxes were a constraint which matches with the t value results. However, (23.65%) of women were neutral with the statement. These findings are somewhat disappointing as 68.71% of respondents complained about high taxes which had an impact on cash flow and decreased working capital which impacts business growth.

Beside high taxes, there are other expenses business pay to operate, for instance, rent, electricity, water, employees, among others. Many expenses may lead a business to close down or stagnate. Perhaps, some women entrepreneurs may go back to informal business where they do not have to pay high taxes and there are few expenses. A strong relationship between these results and Vis (2012), Malunda (2014); Rwirahira (2018) has been reported in the literature. The following section discusses the findings relating to the lack of market opportunities for women-owned businesses.

5.2.47 Lack of market opportunity

The statement was "Lack of market opportunities is a constraint". The purpose of the statement was to determine whether a lack of market opportunities was a constraint experienced by women entrepreneurs in running SMEs in Kigali. Table 34 (Appendix B), question 47 presents the findings regarding whether a lack of market opportunities is a constraint to women-owned SMEs in Kigali.

It can be seen from the data in Table 34 (Appendix B), question 47, the mean score was 3.79 (more than 3) and the t-test analysis provided t = 17.969 (p=.000<.05). The null hypothesis that the mean score = 3 was dismissed because the P-value (0.000) for the t-value of 17,969 was greater than 0.05, the degree of importance, and the substitute hypothesis that the mean score was greater than 3 was adopted.

This shows that the respondents agreed with the statement that a lack of market opportunities was a constraint experienced by women entrepreneurs in running businesses in Kigali. From the same Table 34 (Appendix B), question 47 it can seen that (71.25%) of respondents agreed with the statement that a lack of market opportunities is a constraint experienced by women entrepreneurs in running SMEs in Kigali. This result confirms the T-test result obtained in the paragraph above. In contrast, (9.34%) of respondents disagreed with the statement, while (19.41%) of respondents remained neutral. The percentage results confirm those of t value in the paragraph above.

Results from this Table 34 (Appendix B), question 47 indicate that the majority (71.25%) of women suffer from obtaining market opportunities. It can be linked to findings in the same Table 34 (Appendix B); question 53 that shows (68.87%) lack education and training; question 54 indicates (77.04%) lack entrepreneurship skills; question 55 reveals (52.94%) lack management skills and question 56 illustrates (62.04%) lack management experience.

All these skills and experience enumerated above are among the major skills required to apply for public and private tenders in supply chain management. Unfortunately, many women-owned SMEs in Kigali fail to comply with the demand of the market - a factor why most of them could not access to business opportunities (Transparency

Rwanda, 2011; Mbabazi, 2015). The following results revealed whether bribery of government officials constitutes a constraint among women-owned SMEs in Kigali.

5.2.48 Bribery of government officials

The statement was “A bribe of government officials is a constraint”. The objective was to identify whether bribery of government officials was a constraint experienced by women entrepreneurs in running SMEs in Kigali. Table 34 (Appendix B), question 48 presents the respondents' views on the item.

Consider the T-test percentage, Table 34 (Appendix B); question 48 illustrates that over half of respondents (58.87%) agreed with the statement that a bribe of government officials is a constraint experienced by women entrepreneurs in running SMEs in Kigali. At the same time, (21.92%) selected a neutral option, while (19.21%) respondents disagreed with the statement. Some of them may have already been asked for a bribe to obtain a service. On the other hand, they may benefit from accepting a bribe, however, it is unethical and prosecutable. These results support the Rwanda bribery index 2018 report (International Transparency, 2018). The next findings discussed are the inability to obtain public tenders.

5.2.49 Inability to obtain public tender

The statement was "Inability to obtain public tender is a constraint”. The objective was to determine if the inability to obtain public tender was a constraint experienced by women entrepreneurs in running SMEs in Kigali. Table 34 (Appendix B), question 49 indicates the views of women-owned SMEs in Kigali. Table 34 (Appendix B), question 49 demonstrates that the mean score was 3.65 (which was more than 3), and the t-test analysis produced at value = 12.931 ($p=.000<.05$). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of 12.931 was more than 0.05, the level of significance, and the substitute hypothesis that the mean score was more than 3 was accepted.

This suggests that the surveyed agreed that the inability to obtain public tender was a constraint experienced by women entrepreneurs in running SMEs in Kigali. Referring to the percentage figures, the same Table 34 (Appendix B), question 49 demonstrates

that from those surveyed, (68.06%) agreed with the statement that the inability to obtain public tender was a constraint experienced by women entrepreneurs in running SMEs in Kigali. This result confirms that of t value obtained above which also supports the statement.

Meanwhile, 16.22% of the surveyed respondents were impartial. In contrast, (15.73%) of respondents were opposed to the statement. As shown in Table 34 (Appendix B), question 49, the majority (68.06%) of respondents perceived it difficult for women entrepreneurs in Kigali to obtain public tender. It might be related to gender issues, lack of skills required, and bribes among the government officials. Transparency Rwanda (2011) reports that in Rwanda, it is difficult for women entrepreneurs to obtain public tender, only few of them can win public market due to their lower education level. Despite their low education level, TI (2018) also observed corruption in the public supply chain.

5.2.50 High transport cost

The statement was "High transport cost is a constraint". The purpose of the statement was to identify if high transport cost was a constraint experienced by women entrepreneurs in running SMEs in Kigali. The findings of this question presented in Table 34 (Appendix B), question 50, revealed the views of respondents on the statement. The findings in Table 34 (Appendix B), question 50 indicates that the mean score was 3.14 (was above 3) and the t-test analysis provided $t = 3.512$ ($p=.000<.05$). The null hypothesis that the average values = 3 was dismissed because the P-value (0.000) for the t-value of 3.512 was greater than 0.05, the degree of importance, and the alternative hypothesis that the mean score was greater than 3 was accepted. This means that the respondents agreed with the statement that high transport cost was a constraint experienced by women entrepreneurs in running SMEs in Kigali.

The majority of respondents (45.97%) as presented in Table 34 (Appendix B), question 50 agreed with the statement that high transport cost is a constraint experienced by women entrepreneurs in running SMEs in Kigali. In contrast (28.12%) of respondents disagreed with the statement. Around a quarter of respondents (25.92%) were neutral. Therefore, these results (45.97%) meet that of T-test also agreed with the statement that high transport cost was a constraint experienced by women entrepreneurs in

running SMEs in Kigali. These results are not encouraging since (45.97%) of women-owned SMEs in Kigali complain of challenges with high transport cost. They spend a lot of money on transport which should be used to grow their business. Most of them are running a business with little money; therefore, any expense decreases working capital. In some instances these women have to hire vehicles to transport their goods, however, if they had their own transport, they would spend less. The United States of America. Department of Commerce (2014); Frazer (2016) and Nsengimana, et al. (2017) all support women-owned businesses having their own transport to conduct their business. The following section debates whether high communication cost was a constraint to women entrepreneurs in Kigali.

5.2.51 High communication cost

The statement was "High communication cost is a constraint" and the purpose of the statement was to identify if high communication cost was a constraint experienced by women entrepreneurs in running SMEs in Kigali. The findings of this question presented in Table 34 (see Appendix B), question 51 revealed the views of respondents on the statement.

Table 34 (Appendix B), question 51 shows that the mean score was 3.17 (which was greater than 3), and the t test analysis made a t value = 3.800 ($p=.000<.05$). The null hypothesis that the average mean score = 3 was rejected due to the P-value (0.000) for the t value of 3.800 was greater than 0.05, the degree of significance, and the substitute hypothesis which obtained a mean greater than that 3 was accepted.

This indicated that the surveyed agreed that high communication cost was a constraint experienced by women entrepreneurs in running SMEs in Kigali. The majority of respondents (50.25%) as presented in Table 34 (Appendix B), question 51 agreed with the statement that high communication cost was a constraint experienced by women entrepreneurs in running SMEs in Kigali. This result is evidence of T-test results discussed in the paragraph above. In contrast (33.82%) of respondents disagreed with the statement, while the minority of respondents (15.93%) were neutral. Despite the major role played by communication in the business world, (50.25%) of women-owned business in Kigali perceived telecommunication cost being too high. The challenge for them is that there is no way to hide from using telecommunication when running a

business. However, what is required is reasonable cost. The cellphone is the most used telecommunication tool among women entrepreneurs in Kigali; they felt that the expenses on communication took a large portion of their profit. Besides, there are other business expenses to pay. It is suggested that cutting telecommunication price could improve the growth of SMEs. The New Times (2016) reported a decrease of new subscribers due to the high price of telecommunication, particular cellphones.

5.2.52 Lack of incubation centre

The statement “Lack of incubation centre is a constraint" was to identify whether the lack of incubation centre was a constraint experienced by women entrepreneurs in running SMEs in Kigali. Table 34 (Appendix B), question 52 presents the opinions of respondents on the statement. The findings in Table 34 (Appendix B), question 52 demonstrate that the mean score was 3.18 (which was greater than 3), and the t test analysis provided a t value = 3.642(p=.000<.05). The null hypothesis that the average mean score = 3 was rejected because the P – value (0.000) for the t value of 3.642 was more than 0.05, the level of significance, and the alternative hypothesis that the mean score was more than 3 was accepted. This suggested that the respondents agreed with the statement that lack of incubation centre was a constraint experienced by women entrepreneurs in running SMEs in Kigali. Table 34 (Appendix B), question 52 also presents the percentage scores.

The results in Table 34 (Appendix B), question 52 illustrates that (50.74%) of women reported that lack of incubator centre is a constraint experienced by women entrepreneurs in running SMEs in Kigali. These results provide evidence to the T-test results above. In contrast, (31.78%) of respondents disagreed with the statement. Almost a filth (17.49%) selected a neutral option. Regrettably, the majority (50.74%) of women entrepreneurs in SMEs in Kigali had a need to learn. They believe that their businesses can perform better and grow if they have an incubation centre to advise, coach, and follow up on their business activities.

As displayed in Table 4 (Appendix B), the vast majority (76.9%) of women-owned SMEs in Kigali have limited secondary schooling. The capacity building is a necessity to enable them to compete in Kigali where they are educated entrepreneurs, most of them running sustainable businesses and embracing ICT. This study is in line with

Ipsos Strategic Marketing (2011) who found that incubation centres in Montenegro actively helped women enterprises to position, identify new opportunities, and most importantly excite many women to launch new businesses which perform well. The following section discusses the skills constraints results.

SKILLS CONSTRAINTS

The previous section concentrated on government constraints. This section highlights constraints related to skills. These include a lack of education and training, a lack of entrepreneurial skills, a lack of management skills, a lack of business experience, and a lack of ICT skills (e.g., Internet) constraint.

5.2.53 Lack of education and training

The purpose of the statement “Lack of education and training is a constraint” was to determine if lack of education and training was a constraint experienced by women entrepreneurs in running SMEs in Kigali. Table 34 (Appendix B), question 53 revealed the position of women-owned SMEs in Kigali. As can be seen in Table 34 (Appendix B), question 53, the results indicate that the mean obtained was 3.68 (which was greater than 3), and the t test analysis made a t value = 12.250 ($p=.000<.05$). The null hypothesis that the average mean score = 3 was rejected due to the P – value (0.000) for the t value of 12.250 which was greater than 0.05, the level of importance, and the alternative hypothesis which obtained a mean greater that 3 average mean was accepted.

This implied that the respondents agreed with the statement that lack of education and training was a constraint experienced by women entrepreneurs running SMEs in Kigali. The percentage in the same Table 34 (Appendix B), question 53 shows that (68.87%) of respondents agreed with the statement that lack of education constitutes a constraint for them in running their SMEs. The same results found in T-test is discussed in the paragraph above. However, (15.2%) of respondents disagreed with the statement, while (15.93%) preferred to keep a neutral position. These results, (68.87%) are likely to be related to a lower level of education as most of women-owned SMEs in Kigali had secondary schooling and less (76.9%) (See Table 4 Appendix B). Running a business in a town like Kigali where competition is still; demand, proper training and

education to respond suitably to the macro environment constraints. This group of women-owned SMEs in Kigali may perform better in their businesses and grow their enterprises if they had the opportunity to relevant entrepreneurship education and training. Lower education level limits women-owned SMEs in Kigali to small-sized businesses. Ndagijimana et al. (2018) identified a relationship between the level of education and the categories of businesses. He concluded that graduate entrepreneurs are more likely running small and medium businesses than the less educated who concentred on micro-enterprises. Lack of entrepreneurial skills constraints are discussed in the next section.

5.2.54 Lack of entrepreneurial skills

The statement was "Lack of entrepreneurial skills is a constraint" and the objective was to identify whether lack of entrepreneurial skills was a constraint experienced by women entrepreneurs in running SMEs in Kigali. The findings in Table 34 (Appendix B), question 54 indicate that the mean obtained was 4.04 (which was greater than 3), and the t test analysis provided a t value = 23.542 ($p=.000<.05$). The null hypothesis that the average mean score = 3 was rejected because the P – value (0.000) for the t value of 23.542 was greater than 0.05, the degree of importance, and the substitute hypothesis which obtained a mean greater than 3 was accepted. This result suggested that the respondents agreed with the argument that a lack of entrepreneurial skills was a constraint experienced by women entrepreneurs in running SMEs in Kigali.

Table 34 (Appendix B), question 54 results demonstrate that most of the respondents (77.04%) agreed with the statement that lack of entrepreneurial skills is a constraint faced in doing business. This result confirms the T-test results in the paragraph above, while (17.28%) of respondents were neutral and very few (5.67%) of the respondents disagreed with the statement.

The results presented above in Table 34 (Appendix B) indicates that women-owned SMEs in Kigali 77.04% did not have entrepreneurial skills; they run business traditionally. There is some evidence that a lack of entrepreneurship skills may affect business performance and growth (Kelley et al., 2017; PSF, 2018). These results seem to be consistent with other research, which found that a lack of entrepreneurship skills hamper women to move forward to their businesses. Their entrepreneurship capability

is limited; they cannot penetrate some industries as they require relevant skills such as ICT, and they are like less competent to win public tender (Chinomona & Maziriri, 2015; Ndisanze. 2017). The next findings address management skills constraint.

5.2.55 Lack of management skills

The statement was "Lack of management skills as a constraint" and the objective was to determine if lack of management skills was a constraint experienced by women entrepreneurs in running SMEs in Kigali. Table 34 (Appendix B), question 55 shows their view on the statement. The findings in Table 34 (Appendix B), question 55 illustrate that the mean score was 3.37 (which was greater than 3), and the t test analysis made a t value = 7.241 ($p=.000<.05$). The null hypothesis that the average mean score = 3 was dismissed because the P – value (0.000) for the t value of 7.241 was greater than 0.05, the degree of significance, and the alternative hypothesis which obtained a mean greater than 3 was accepted. This indicated that the participants agreed with that a lack of management skills was a constraint experienced by women entrepreneurs in running SMEs in Kigali.

The findings presented in Table 34 (Appendix B), question 55 point out that more than half (52.94%) of respondents agreed with the statement that lack of management skills was a constraint experienced by women entrepreneurs in running SMEs in Kigali. These results are in agreement with T-test results in the paragraph above. Around a quarter, (26.23%) of respondents disagreed with the statement and (20.83%) of respondents were neutral. Women-owned SMEs in Kigali (52.94%) recognised their business management weakness.

Lack of business management ability leads a business to failure or stagnation. Starting a business may be easy, but keeping its doors open and moving forward requires management skills. Lack of management skills may have contributed to the lower number of women's small, medium, and large businesses, rather their businesses concentrate in informal and micro enterprises (Mbabazi, 2015; Rwanda, National Institute of Statistics of Rwanda, 2018).

5.2.56 Lack of business experience

The statement "Lack of business experience is a constraint" was to determine whether lack of business experience was a constraint experienced by women entrepreneurs in running SMEs in Kigali. Table 34 (Appendix B), question 56 illustrates the findings concerning the views of women-owned SMEs in Kigali. Table 34 (Appendix B), question 56 demonstrate the results. The mean obtained was 3.66 (which was greater than 3), and the t test analysis made a t value = 13.062 (p=.000<.05). Then, the null hypothesis that the mean score = 3 was rejected due the P – value (0.000) for the t value of 13.062 obtained which was greater than 0.05, the level of importance, and the alternative hypothesis that the mean score was more than 3 was accepted. This implied that the surveyed agreed that a lack of management skills was a constraint experienced by women entrepreneurs in running SMEs in Kigali.

This Table 34 (Appendix B) presents various scores, including the percentage. It can be seen from the data in Table 34 (Appendix B), question 56 that (62.04%) of respondents agreed with the statement that lack of business experience is a constraint facing women-owned SMEs in Kigali. These results are evidence of T-test results above that also found respondents agreed with the statement. On the other hand, (17.12%) of respondents disagreed with the statement, while (20.84%) of respondents selected a neutral option.

These findings explain the difficulty women-owned SMEs in Kigali experience to compete with men who have been in business for many years. They build a secure experience, and their businesses are established. It is hard for women to compete in the same market with their male counterparts. It seems that women entrepreneurs in Kigali struggle to establish business and make changes where needed.

Kelley et al. (2017) in their report, women's entrepreneurship 2016/2017 worried about less business experience among women entrepreneurship that makes them less competitive. It suggests that empowering women entrepreneurs with relevant business skills may increase their ability to compete in a business environment. Lack of information technology skills constraint is discussed in the next section.

5.2.57 Lack of Information and Communication Technology skills

The statement "Lack of ICT skills is a constraint" was to identify whether lack of ICT skills was a constraint experienced by women entrepreneurs in running SMEs in Kigali. Table 34 (Appendix B), question 57 indicates the opinion of women-owned SMEs in Kigali. The results in Table 5.34, question 57 shows that the mean obtained was 3.65 (which was greater than 3), and the t test analysis provided a t value = 12.760 (p=.000<.05). Hence, the null hypothesis that the mean score = 3 was rejected because the P – value (0.000) for the t value of 12.760 was greater than 0.05, the degree of importance, and the substitute hypothesis that the mean score was more than 3 was accepted. This indicated that the respondents agreed with the statement that a lack of ICT skills was a constraint experienced by women entrepreneurs.

Table 34 (Appendix B), question 57 illustrates that 60.54% of respondents agreed with the statement that lack of ICT is a constraint for women-owned SMEs in Kigali. Furthermore, the T-test results found the same. In contrast, (17.4%) of respondents disagreed with the statement, while (22.06%) of the respondents were neutral. The possible explanation of this result (60.54%) is that the majority of women entrepreneurs in Kigali acknowledge their weakness to exploit ICT devices and Internet of things to access information that they can use to promote their businesses.

Besides this, many government services and business transactions are done online that require ICT skills. Lack of ICT skills compels them to look around for assistance. Actual running of the business involves technology; lack of ICT skills results in them running traditional businesses that impedes their business growth and sustainability.

Empowering women with ICT skills is the strategy needed to integrate them in business competition and the workplace. Women entrepreneurs could not compete with their male counterparts in Kigali. It is suggested that empowering women with relevant ICT skills related business could shift them from running a traditional business to modern ones and become competitive (Bishumba, 2017).

OWN FEAR CONSTRAINT

The previous section focused on skills constraints facing women entrepreneurs in running SMEs in Kigali. This section emphasises the own fear constraints among women-owned businesses. It contained two questions, 58 and 59 (See Appendix A).

5.2.58 HIV/AIDS constraint

The statement “HIV/AIDS is a constraint” was presented to determine if HIV/AIDS was a constraint experienced by women entrepreneurs in running SMEs in Kigali. Women-owned SMEs in Kigali provided their perceptions of whether HIV/AIDS is a constraint they are facing in doing business in Kigali and their responses are displayed in Table 34 (Appendix B), question 58.

The results in Table 5.34 (Appendix B), question 58 demonstrate that the mean score was 4.47 (which was more than 3), and the t test analysis produced a t value = 42.994 ($p=.000<.05$). The null hypothesis that the mean score = 3 was rejected because the P – value (0.000) for the t value of 42.994 was more than 0.05, the level of significance, and the alternative hypothesis that the mean score was more than 3 was accepted. These results indicated that the respondents agreed with the statement that HIV/AIDS was a constraint experienced by women entrepreneurs. Table 34 (Appendix B); question 58 demonstrates that the vast majority (92.38%) of respondents agreed with the statement that HIV/AIDS is a constraint experienced by women entrepreneurs in running SMEs in Kigali. This result confirms the T-test result. Only (5.65%) of respondents disagreed with the statement. A small percentage of (1.97%) respondents disagreed with the statement.

The results indicated that (92.38%) of respondents confirmed that HIV/AIDS is a constraint facing women-owned SMEs. This was disappointing because it confirms that people stigmatise HIV/AIDS and this impacts negatively on businesses of those who are HIV/AIDS positive. Some consumers do not support the business of those women that are HIV positive because they fear being infected. Furthermore, suppliers sometime do not provide them with credit because of fear that could fall sick and will be unable to pay creditors. Based on this, women-owned SMEs in Kigali living with

HIV/AIDS are frustrated and discouraged due to isolation from their colleagues and networks. In addition, they spend large sums of money to keep healthy and this decreases their working capital; consequently, their businesses do not move forward. Avert (2018) reports that HIV/AIDS undoubtedly decreases productivity and profit of many women-owned businesses.

5.2.59 Fear of failure constraint

The statement “Fear of failure is a constraint” was posed to identify whether fear of failure was a constraint experienced women entrepreneurs and Table 34 (Appendix B), question 59 revealed the perception of respondents.

The findings illustrates that the mean score was 3.54 (which was more than 3), and the t test analysis produced a t value = 9.780(p=.000<.05). The null hypothesis that the mean score = 3 was rejected because the P – value (0.000) for the t value of 9.780 was more than 0.05, the level of significance, and the alternative hypothesis that the mean score was more than 3 was accepted. This implied that the respondents agreed with the statement that fear of failure was a constraint experienced by women entrepreneurs in running SMEs in Kigali.

As can be observed from Table 34 (Appendix B), question 59 that the majority of respondents, (57%) agreed with the statement that fear of failure is a constraint experienced by women entrepreneurs in running SMEs. This result was also found in T-test results in the paragraph above. In contrast, (25.06%) of respondents disagreed with the statement. At the same time, (17.94%) of respondents took a neutral position.

Unfortunately, (57%) of women-owned SMEs in Kigali work under the fear of failure pressure. There are several possible explanations for this result. It can be attributed to background stereotype behaviour that ascribe women as weak to run a successful business. Despite the fear, the research revealed that these women work hard to run their businesses and succeed like their male counterparts.

Most of these women received start-up capital (44.9%) from husbands, families, and friends (See 17, Appendix B) and failure for them also results in disappointing those who helped them to start their businesses. It is under these circumstances that they

work and push their businesses forward to ensure sustainability and success of the business. In addition, some families depend on them financially and business failure could have huge implications. The finding from this study is supported by the Global Entrepreneurship Monitor 2016/2017 Report on women's entrepreneurship (Kelley et al., 2017).

Women in business in Kigali fear failure and having to disappoint family and the community. These women are aware that success in business will increase their value in the community and with their families. It will also improve their reputation and respect. Studies conducted in Kigali and the western province of Rwanda revealed that women entrepreneurs contribute actively to economic growth and in particular to the families and community; they add the value due to the output of their businesses coupled with their contribution to improving the lives of their families and communities (Mutambuka et al., 2016).

SUMMARY OF THIS SECTION

In summary, this study identified the constraints experienced by women entrepreneurs in running SMEs in Kigali. These constraints include HIV/AIDS (92.38%), lack of entrepreneurial skills (77.04%), access to government service (72.24%), lack of market opportunities (71.25%), lack of education and training (68.87%), high taxes (68.71%), inability to obtain public tender (68.06%), lack of business experience (62.04%), lack of information technology skills (60.54%), bribery of government officials (58.87%), business registration (57.5%), fear of failure (57%), lack of management skills (52.94%), lack of incubator centre (50.74%), and high communication cost (50.25%). The next section discusses the ICT findings.

SECTION 6: THE CONTRIBUTION OF ICT TO IMPROVE WOMEN BUSINESSES AND FIND A SOLUTION TO CONSTRAINTS THEY FACE IN DOING BUSINESS IN KIGALI

This section responds to the third research question “How could information and communication technology intervene to find solutions to the constraints facing women entrepreneurs in doing business in Kigali, Rwanda”? The objective of the question was to explore how ICT could intervene to find the solution to constraints facing women entrepreneurs.

This section is the most significant in the questionnaire; it refers to questions from 60 to 150 (See Appendix A). However, the questions 76 -101 called online access are in the form of a Likert scale. A quantitative survey was used to gather information from 409 women-owned SMEs in Kigali. The results are presented in descriptive statistics and T-test in tables and charts.

5.2.60 Information and communication technology devices

The question “Do you own some of the devices enumerated below”? was posed to identify the ICT devices owned by women-owned SMEs. They were requested to select responses on a list, and more options were allowed. Table 35 (Appendix B) indicates that, of the 86 respondents who indicated the devices they have, the majority own cell phones (30.2%), laptops (17.4%) and computers (16.3%). Figure 5.22 illustrates this more clearly.

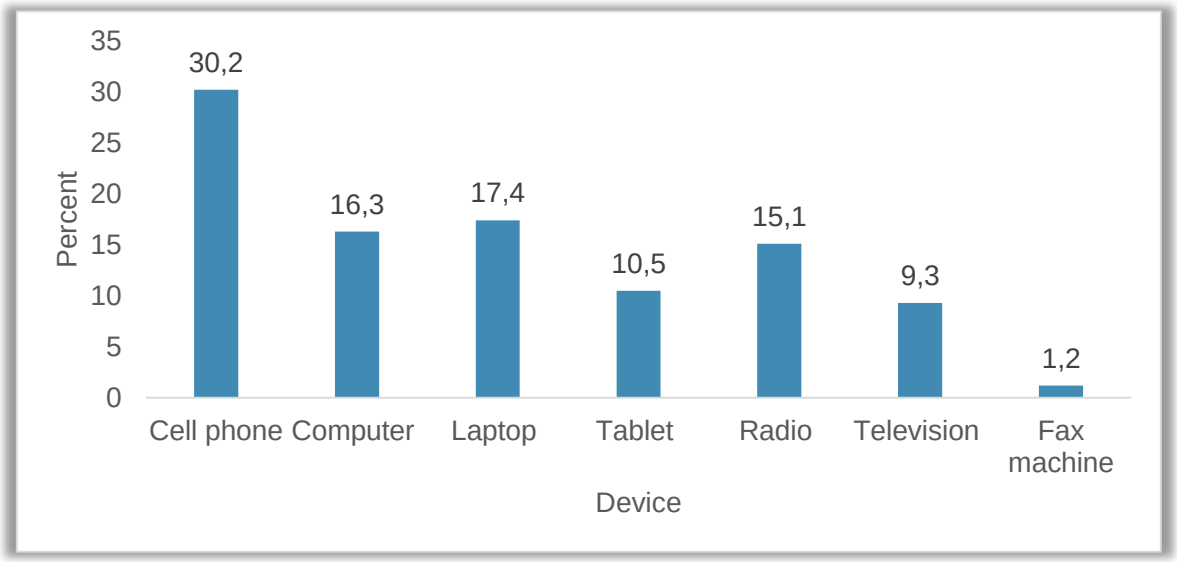

Figure 5.22: Devices owned

5.2.61 Access to the Internet

The question “Do you have access to the Internet?” was posed to identify how many women-owned SMEs access the Internet and according to Table 36 (Appendix B) and Figure 5.23, the majority had access (79.8%).

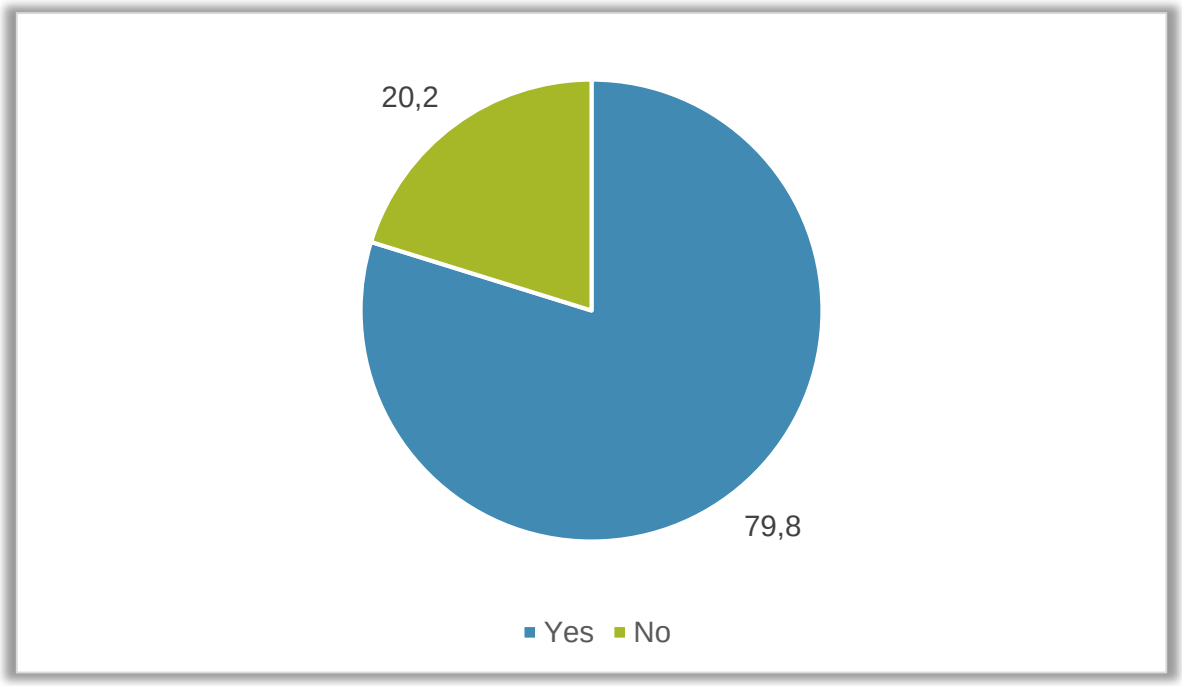

Figure 5.23: Internet access

5.2.62 Devices used to access Internet

This question was only asked to respondents who responded “Yes” to the previous question. The question was “If yes to question 61, how do you access the Internet”? The objective of the question was to investigate which devices women-owned SMEs use to access the Internet. Many options were allowed. According to Table 37 (Appendix B) and Figure 5.24, the majority of respondents used a cellphone (64.6%) and a computer (21.0%) to access the Internet.

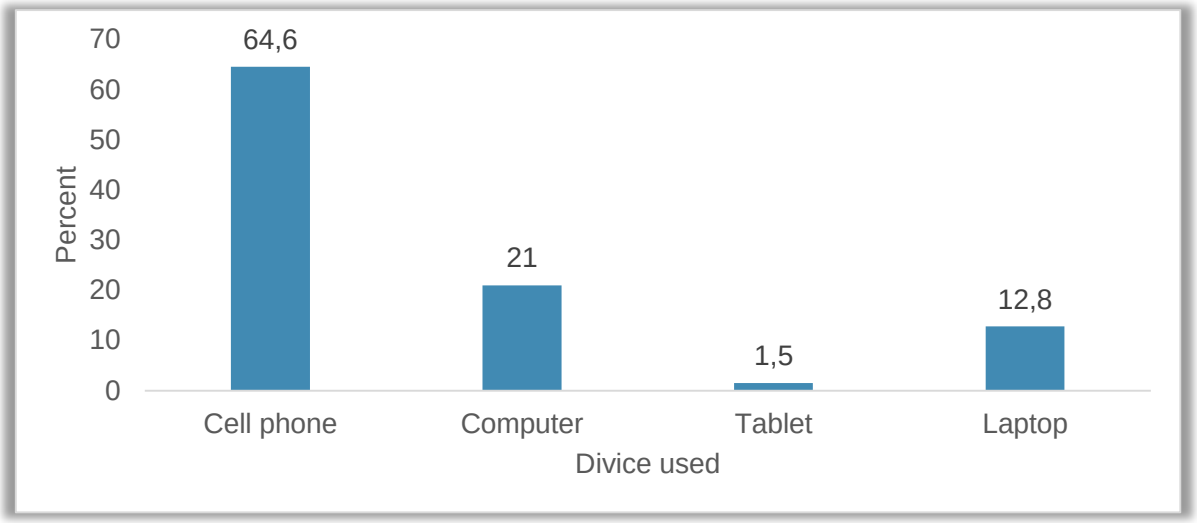

Figure 5.24: How accessing Internet

5.2.63 Place where respondents access the Internet

The question “Where do you access the Internet?” was aimed at investigating where respondents accessed the Internet. Many options were allowed and according to Table 38 (Appendix B), most respondents accessed the Internet at home (33.3%), at work or office (24.8%) and at a friend’s home (14.1%). This is illustrated in Figure 5.25.

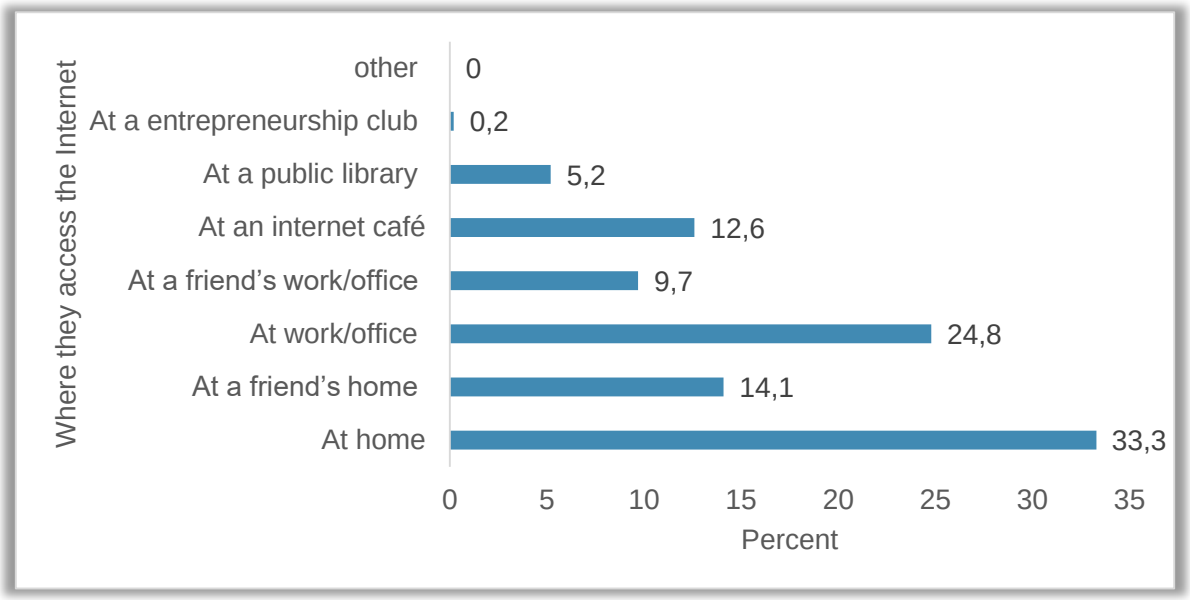

Figure 5.25: Where they access the Internet

5.2.64 Use of ICT devices in business

The question was "How do you use the following devices in your business"? The purpose of the question was to examine to what extend women-owned SMEs in Kigali used ICT devices in their businesses. They were requested to rate the item using a five-point Likert scale - never 1, and always 5. According to Table 39 (Appendix B), most respondents always (73.35%) or very often (25.9%) use a cellphone; they never or rarely use a computer (49.14% and 40.54%), laptop (65.36% and 20.64%), tablet (94.81% and 3.21%), television (65.53% and 10.02%) and a fax machine (98.52% and 0.99%); sometimes (23.46%) use the Internet café. Figure 5.26 illustrates this more clearly.

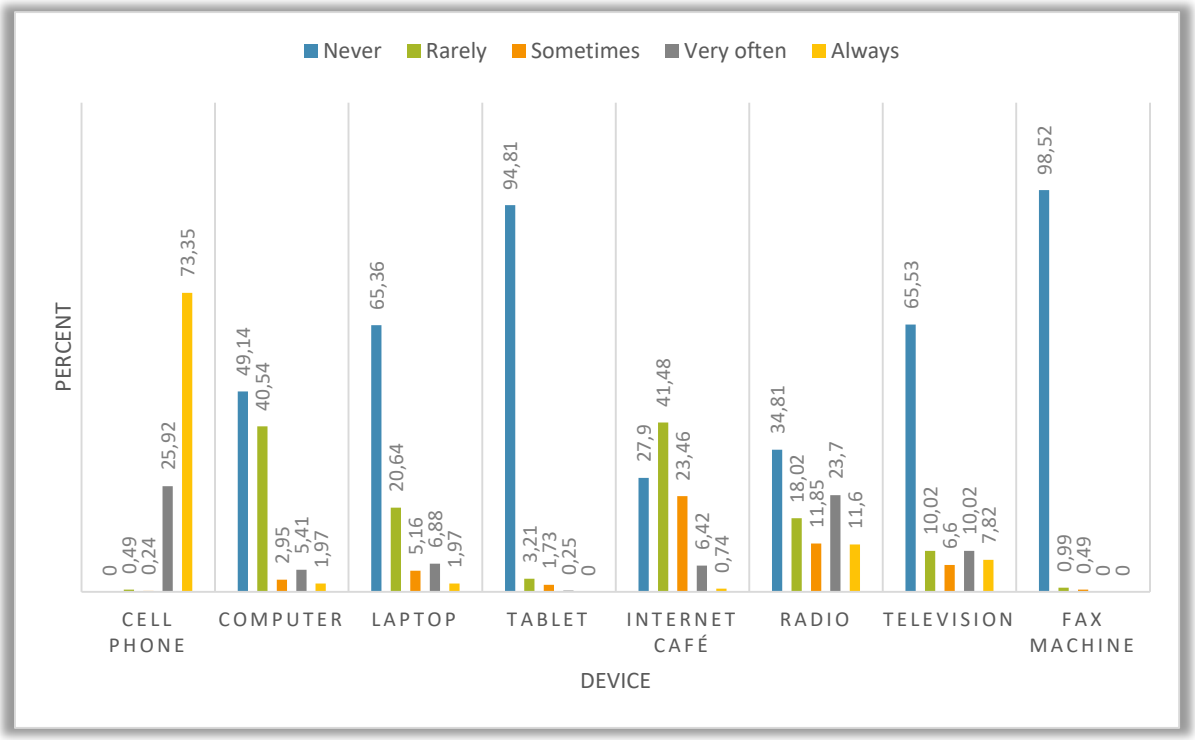

Figure 5.26: use of devices

5.2.65 Rating the usage of ICT in business

The question was “How do you rate the utilisation of ICT (e.g. cellphone, Internet) in your business”? The objective of the question was to determine the level of ICT usage in their businesses. They rated the statement on a five-point Likert scale - useless 1 and very important 5. Table 40 (Appendix B) are statements regarding utilisation of Internet and cellphone in business and the majority of respondents rated the utilisation of ICT as important (15.93% + 44.36% = 60.29%). Only six (6) (1.47%) people rated it as “useless”.

5.2.66 Impact of ICT tools on business performance and growth

The statement was “ICT instruments can be used to increase business performance and growth”. The purpose of the statement was to measure the extent to which women-owned SMEs in Kigali perceived the effect of ICT instruments in business performance and growth. A five-point Likert scale was used to rate the item, strongly disagree 1, and strongly agree 5.

Table 41 (Appendix B) are statements regarding utilisation of Internet and cellphone in business indicates that the majority of respondents agreed (16.42% + 38.73% = 55.15%) that ICT instruments can be used to increase business performance and growth. Based on the results, the majority (55.15%) of women-owned SMEs in Kigali believed that integration of ICT into a business could improve business performance and growth. Similarly, Sasakawa Peace Foundation (2017) found that utilisation of ICT among women entrepreneurs in Southeast Asia economies improved their enterprises' performance, growth, and competitiveness. The respondents' competency in ICT is discussed next.

5.2.67 Competency in computer literacy of women-owned SMEs in Kigali

The statement “Describe your competency in using a computer” was to evaluate the computer literacy skills of women-owned SMEs in Kigali. The various skill levels were provided; the respondents were requested to select one option that defines their competency in computer literacy. Table 42 (Appendix B) presents statements regarding utilisation of Internet and cellphone in business and indicates that the majority described their competency as “Average” (48.52%) while 2 (0.49%) regarded themselves as experts. Figure 5.27 illustrates this more clearly.

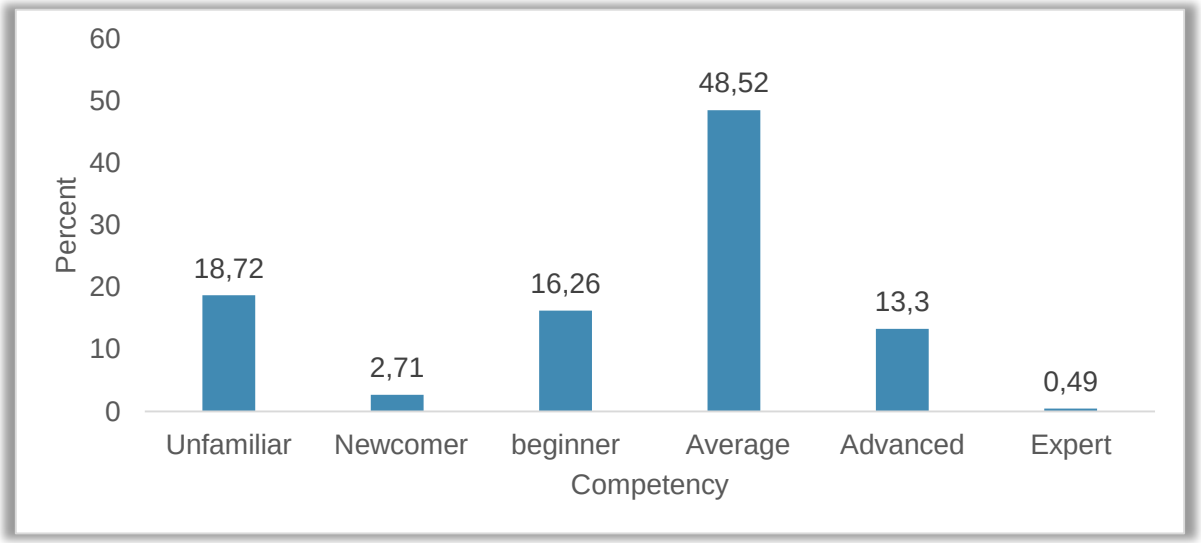

Figure 5.27: Competency

From these results in Table 42 (Appendix B) and Figure 5.27, it can be seen that the average level of computer literacy is (48.52%). What is interesting in this data is that

(13.79%) of respondents were advanced and experts in computer skills. They adequately used computer application, coding, and programming. They were able to integrate ICT into their businesses to be more competitive. Many authors agreed that window of opportunities opens for skilled women entrepreneurs' particularly those equipped with ICT skills (UNCTAD, 2014; Oster & Wang, 2016; GmbH, 2017).

5.2.68 Activities can perform on the computer

The statement "Please indicate activities you can perform on the computer" was put forward to identify the activities respondents could perform on computer. Many options were allowed. Table 43 (Appendix B) are statements regarding utilisation of Internet and cellphone in business and shows the percentage distribution of the activities that can be performed on the computer. Most respondents indicated that they can "exchange with networks via social media (e.g., Facebook, histogram, WhatsApp)" (18.1%), send and receive emails (16.5%) and send and receive money (16.0%) using a computer.

Table 44 in Appendix B provides statements regarding utilisation of Internet and cellphone in business. The respondents disagreed with all the statements except, statement 84 (I use the Internet to access government services", which they agreed with; statement 85 (I registered my business online) for which they were "neutral" and statement 94 (I order my stock via cellphone) which they also agreed with, according to the t-test results. Each item in Table 44 (Appendix B) is discussed below.

5.2.69 Searching online on how to challenge gender inequality in business

The statement was "I search for information on the Internet on how to challenge gender inequality in business." The objective of the statement was to investigate whether women-owned SMEs search for information online on how to challenge gender inequality in business. To access respondents' opinions on the statement they were requested to rate the statement on a five-point Likert scale, strongly disagree 1, and strongly agree 5.

The findings in Table 44 (Appendix B), question 76 indicates that the mean score was 1.80 (which was less than 3), and the t-test analysis produced a t value = -24.590 (p=.000<.05). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of -24.590 was less than 0.05, the level of significance, and the alternative hypothesis that the mean score was less than 3 was accepted. This indicated that the respondents disagreed with the statement that "I search for information on the Internet on how to challenge gender inequality in business." In the same Table 44 (Appendix B), question 76 indicates that the large majority of respondents (85.75%) disagreed with the statement that "I search for information on the Internet on how to challenge gender inequality in business". This result confirmed the T-test result obtained in the paragraph above. Furthermore, (8.6%) of the respondents agreed with the statement and (5.65%) maintained a neutral position.

These findings may be related to the findings obtained earlier in Table 34 (Appendix B), question 34 which indicated that almost all respondents (98.52%) reported that gender inequality in business was not a constraint in doing business in Kigali. There was no need to leverage the Internet as they did not have any issues regarding gender inequality in business. The findings on online information to overcome cultural norms is discussed next.

5.2.70 Searching online on how to overcome cultural norms facing women entrepreneurs

The statement "I use the Internet to search how I can cope with beliefs and cultural challenge women entrepreneurs" was presented to determine whether women entrepreneurs surveyed use the Internet to search how they can cope with cultural challenges facing women entrepreneurs.

The findings in Table 44 (Appendix B), question 77 illustrates that the mean score was 1.72 (which was less than 3), and the t-test analysis produced a t value = -26.453 (p=.000<.05). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of -26.453 was less than 0.05, the level of significance, and the alternative hypothesis that the mean score was less than 3 was accepted.

This indicated that majority of the respondents disagreed with the statement “I use the Internet to search how I can cope with beliefs and cultural challenge women entrepreneurs.” Furthermore, Table 44 (Appendix B), question 77 provides results in percentages which shows that over two-thirds of respondents 84.69% disagreed with the statement. This result confirms the T-test results obtained in the previous paragraph. The findings indicate that (8.15%) of the respondents were neutral. At the same time, 7.16% of the respondents agreed with the statement. As reported above in Table 34 (Appendix B), question 36 the majority, (84.31%) of those surveyed reported that customs and local culture did not disadvantage women to operate a business in Kigali. Comparing these two results (Table 34, question 36 and Table 44, question 77) it can be concluded that there was no need to search how to cope with beliefs and cultural norms as they were not perceived as a threat. The findings on the role of the Internet in accessing finance is discussed in the next section.

5.2.71 Using Internet information to access finance

The statement was "I search for information on the Internet on how I can access finance". The purpose of the statement was to determine whether women-owned SMEs in Kigali search for information on the Internet on how they can access finance. The results are presented in Table 44 (Appendix B). As can be seen in the table, question 78 the mean score was 1.73 (which was less than 3), and the t-test analysis produced a t value = -26.430 (p=.000<.05). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of -26.430 was less than 0.05, the level of significance, and the alternative hypothesis that the mean score was less than 3 was accepted. These findings mean that the respondents disagreed with the statement “I search for information on the Internet on how I can access to finance”. Referring to percentage results, it observed from Table 44 (Appendix B), question 78 that 82.76% of respondents disagreed with the statement that "I search for information on the Internet on how I can access to finance" and the same results were obtained above in T-test results. At the same time, 8.15% of respondents preferred being impartial, while 7.16% of the respondents agreed with the statement.

Table 34 (Appendix B), question 37 results indicate that (74.2%) of respondents viewed access to finance for women-owned business in Kigali as not a constraint. Also, among the respondents, (17.69%) were neutral. Therefore, the results in Table 34

(Appendix B), question 37 may justify why (82.76%) of respondents in Table 44 (Appendix B), question 78 denied searching information on the Internet on how they can access finance when they stated that access to finance was not a constraint facing women-owned SMEs.

5.2.72 Online information to access reliable finance

The statement "I search for information on the Internet on where I can access finance, for instance, find a loan on a good deal" was to investigate whether respondents used the Internet to search for reliable finance to start or grow their businesses. The results presented in Table 44 (Appendix B), question 79 demonstrates that the mean score was 1.75 (which was less than 3), and the t-test analysis produced a t value = -25.420 (p=.000<.05). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of -25.420 was less than 0.05, the level of significance, and the alternative hypothesis that the mean score was less than 3 was accepted. This indicated that the respondents disagreed with the statement "I search for information on the Internet on where I can access finance, for instance, find a loan on a good deal". The result in percentage also supports the T-test. According to results in Table 44 (Appendix B), question 79, the majority (82.52%) of respondents disagreed with the statement that "I search for information on the Internet on where I can access finance, for instance, find a loan on a good deal". Only (6.65%) of the respondents agreed with the statement, while (10.84%) of respondents were neutral.

As surveyed, (74.2%) reported that access to finance was not a constraint for them (see Table 34 (Appendix B), question 37. This may be a reason for many of them not using the Internet to search for loans or funding opportunities. The following findings discusses online information regarding where to find a loan with a low interest rate.

5.2.73 Online information concerning low-interest rate

The statement was "I search for information on the Internet where I can get a loan with lower interest rates" was posed to investigate whether the respondents leverage the Internet to find where they can obtain loans with low interest rate. The results presented in Table 44 (Appendix B), question 80 reports that the mean score was 1.73 (which was less than 3), and the t-test analysis produced a t value = -25.405 (p=.000<.05).

The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of -25.405 was less than 0.05, the level of significance, and the alternative hypothesis that the mean score was less than 3 was accepted.

This indicated that the respondents disagreed with the statement. The percentage figures provide evidence of T-test result where the majority (81.82%) of respondents also disagreed with the statement. Meanwhile, (10.81%) of the respondents were impartial and (7.37%) agreed with the statement. The next finding discusses whether the respondents leverage the Internet to apply for loans successfully.

5.2.74 leveraging the Internet to successfully apply for a loan

The statement "I search for information on the Internet on how to apply for a loan successfully" was presented to respondents to determine if they used the Internet to learn how to successfully apply for a loan. The results are presented in Table 44 (Appendix B), question 81 and indicates that the mean score was 1.79 (which was less than 3), and the t-test analysis produced a t value = -24.270 (p=.000<.05). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of -24.270 was less than 0.05, the level of significance, and the alternative hypothesis that the mean score was less than 3 was accepted.

The results suggested that (81.28%) of respondents disagreed with the statement that confirms the results found in T-test results in the above paragraph. In addition, (10.59%) of the respondents were neutral, while (8.13%) agreed with the statement.

5.2.75 Searching online loans without demanding collateral

The statement was "I search for information on the Internet on where I can obtain loans that do not demand guarantee". The purpose of the statement was to investigate whether respondents leverage the Internet to find where they can find loans without collateral. The results presented in Table 44 (Appendix B), question 82 illustrate that the mean score was 1.76 (which was less than 3), and the t-test analysis produced a t value = -24.687 (p=.000<.05). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of -24.687 was less than 0.05, the

level of significance, and the alternative hypothesis that the mean score was less than 3 was accepted. This implied that the respondents disagreed with the statement.
In addition, percentage figures confirm the T-test results in the paragraph above. The same Table 44 (Appendix B), question 82 indicates that the vast majority (81.19%) of respondent disagreed with the statement and (11.14%) of respondents were neutral. At the same time, (7.68%) of respondents agreed with the statement.

5.2.76 Searching online networks

The statement “I search networks on the Internet to find whom I can collaborate with to improve my business” was posed to examine whether respondents leverage the Internet to search for networks that they could collaborate with to improve their businesses.

Table 44 (Appendix B), question 83 indicates that the mean score was 1.74 (which was less than 3), and the t-test analysis produced a t value = -25.577 (p=.000<.05). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of -25.577 was less than 0.05, the level of significance, and the alternative hypothesis that the mean score was less than 3 was accepted.

This explained that the respondents disagreed with the statement. Table 44 (Appendix B), question 83 demonstrated that the large majority (82.8%) of respondents disagreed with the statement. This result provides evidence of T-test results in the above paragraph. In addition, (8.36%) of the respondents agreed with the statement, while 8.85% were impartial.

Compared these findings, (82.8%) with the findings in Table 34 (Appendix B), question 43, where the majority (62.1%) could enjoy a support network. Perhaps, it was the reason why they did not leverage the Internet to search for networks to collaborate. These findings were contradictory to a study conducted in Bangladesh, which found that leveraging the Internet helped women entrepreneurs to identify networks and markets for their products (Rahman, 2016). The following findings relate to online access to government services.

5.2.77 Online gateway to access public services

The statement "I use the Internet to access government services" was presented to determine to which extend women-owned SMEs used the Internet to access government services. The findings presented in Table 44 (Appendix B), question 84 indicates that the mean score was 3.12 (which was more than 3), and the t-test analysis produced a t value = 2.063 (p=.000<.05). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of 2.063 was more than 0.05, the level of significance, and the alternative hypothesis that the mean score was more than 3 was accepted.

This suggested that the respondents agreed with the statement as evident in Table 44 (Appendix B), question 84. This confirms the T-test result in the paragraph above. In contrast, (28.61%) of respondents disagreed with the statement, while almost a quarter of respondents (22.74%) were impartial.

These findings indicate that the majority (48.65%) of women-owned SMEs in Kigali used the Internet to access government services. In Rwanda since 2014, online business registration became mandatory. Furthermore, other government services related businesses, for instance, paying taxes were done online as confirmed by Rwahigi (2014) and The New Times (2014). The following section presents the findings regarding online business registration.

5.2.78 Online business registration

The statement "I registered my business online" was posed to determine whether women-owned SMEs registered their businesses online. The results presented in Table 44 (Appendix B), question 85 indicate that the mean score was 2.93 (which was slightly less than 3), and the t-test analysis produced a t value = -0.98 (p=.000<.05). The null hypothesis that the mean score = 3 was not rejected because the P-value (0.000) for the t value of -0.98 was almost equal to 0.05, the level of significance, and the null hypothesis was not rejected. Also, Table 44 (Appendix B), question 85 indicates that (47.19%) agreed with the statement versus 38.64% who disagreed with a difference of (8.55%) in favour of those who agreed with the statement. There was a divided opinion among the respondents on the statement "I registered my business

online". Therefore, the T-test results failed to reject the null hypothesis. It suggested that the respondents were neutral. According to the results, (47.19%) registered their businesses online. It can be explained that they started their businesses after 2010, when the online business was introduced. Many of the women entrepreneurs perceived online registration as a solution to limit physical mobility, sexual abuse, queuing, and save money and time (BIZTEC AFRICA, 2014; Rwahigi, 2014; The New Times, 2014). These findings are consistent with findings of past studies by UNCTA (2014), which found that online business registration was an advantage and protects women entrepreneurs.

5.2.79 Searching online information to run a valid business while paying fewer taxes

The statement “I search for information on the Internet on how to run a legal business and pay low taxes” was put forward to examine whether women-owned SMEs in Kigali search for information online on how to conduct a legal business, while paying low taxes. The findings presented in Table 44 (Appendix B), question 86 indicates that the mean score was 1.97 (which was less than 3), and the t-test analysis produced a t value = -17.375 ($p=.000<.05$). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of -17.375 was less than 0.05, the level of significance, and the alternative hypothesis that the mean score was less than 3 was accepted. These findings suggest that the respondents disagreed with the statement that "I search for information on the Internet on how to run a legal business and pay low taxes".

The T-test results also confirmed the percentage figures in Table 44 (Appendix B), question 86 where the majority of respondents (75.3%) disagreed with the statement, (15.4%) of respondents agreed with the statement, while (9.29%) preferred to remain neutral. However, these findings are disappointing; the majority (75.3%) of women-owned SMEs in Kigali did not search online information on how they can run a legal business but paid high tax that could be revised. Unfortunately, Table 34 (Appendix B), question 46 indicates that (68.71%) of women-owned SMEs in Kigali faced tax constraints. These results suggested that they were in need to search online on how to overcome the tax constraints they experienced.

These women entrepreneurs should take advantage of the Internet because they can find vital information to overcome tax constraints. In his 12 years of longitudinal research, Gunderson (2015) discovered that over 93% of USA SMEs paid more taxes than they should be paying. This was due to count error and ignorance of the regime. He advised entrepreneurs to use online tax software, for instance, TaxSlayer, TurboTax which are error-free and does not require an expert. The following results explain women entrepreneurs' views on online learning.

5.2.80 Online entrepreneurship learning

The statement "I use the Internet to learn how business works" was presented to determine whether women-owned SMEs leverage the Internet to learn how they can run successful businesses. The findings presented in Table 44 (Appendix B), question 87 indicates that the mean score was 1.93 (which was less than 3), and the t-test analysis produced a t value = -19.992 ($p=.000<.05$). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of -19.992 was less than 0.05, the level of significance, and the alternative hypothesis that the mean score was less than 3 was accepted. This indicated that the respondents disagreed with the statement that "I use the Internet to learn how business works". Almost two-thirds of respondents (73.88%) disagreed with the statement that "I use the Internet to learn how business works" and these results provide evidence for T-test results in the paragraph above. However, (15.67%) of respondents were neutral while, (10.45%) agreed with the statement.

Unfortunately, the results demonstrate that the majority of women-owned SMEs in Kigali, did not leverage the Internet to learn how they can conduct successful enterprises. However, as discussed above, Table 34 (Appendix B), question 54 proved that (77.04%) of women-owned SMEs in Kigali lack entrepreneurial skills. Therefore, they should empower themselves by making use of online learning to enhance their entrepreneurship skills and strategies to improve their business efficiency, effectiveness, performance and productivity.

Table 34 (Appendix B), question 57 indicated that (60.54%) of women-owned SMEs in Kigali complained of a lack of ICT skills. This may also be the reason that they did not use the Internet to empower themselves in entrepreneurship. It also cannot be ignored that many women entrepreneurs in Kigali run small-sized businesses; they may not

find online learning an appropriate fit with their businesses. Vickery et al. (2004) and Aganathan et al. (2018) observed that women-owned businesses are comparatively small scale, selling convenience products and services which makes it difficult to find online entrepreneurship an appropriate strategy. Many ICT programs are not relevant to small scale businesses. The following results regarding leveraging the Internet for effective business management is presented in Table 44 (Appendix B), question 88.

5.2.81 Online business management learning

The statement "I use the Internet to learn how I can manage the business and make it successful" was aimed at investigating whether women-owned SMEs leverage the Internet to learn how they can manage the business to succeed. The findings are presented in Table 44 (Appendix B), question 88 and illustrate that the mean score was 1.70 (which was less than 3), and the t-test analysis produced a t value = -27.586 ($p=.000<.05$). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of -27.586 was less than 0.05, the level of significance, and the alternative hypothesis that the mean score was less than 3 was accepted. This suggested that the respondents disagreed with the statement.

The percentage results indicate that (83.37%) of respondents also disagreed with the statement. These results certified the results obtained in T-test above, while (10.51%) of respondents preferred maintaining a neutral stance and (6.12%) agreed with the statement.

These findings are disappointing because earlier findings in Table 34 (Appendix B), question 55 indicated that the majority (52.94%) of women-owned SMEs in Kigali lacked management skills. Therefore, leveraging the Internet could be a sustainable solution to overcome the constraint of a lack of management skills among women-owned businesses.

However, the absence of leveraging the Internet may be attributed to a lack of ICT skills or ignorance. These results share a number of similarities with Adewoye et al. (2013) findings which indicated that only (12.5%) of women entrepreneurs in South Western Nigeria used the Internet to improve their business management and performance. The next discussion focuses on the online market extension.

5.2.82 Searching online to extend market

The statement "I search online new markets to find where I can sell my products or services" was presented to respondents to investigate whether women-owned SMEs in Kigali use online searches to identify where they can sell products or services. The findings presented in Table 44 (Appendix B), question 89 show that the mean score was 1.676 (which was less than 3), and the t-test analysis produced a t value = -27.573 (p=.000<.05). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of -27.573 was less than 0.05, the level of significance, and the alternative hypothesis that the mean score was less than 3 was accepted. This indicated that the respondents disagreed with the statement that "I search new online markets to find where I can sell my products or services".

The results confirm the T-test in the paragraph above and indicates that an important number of respondents (83.78%) disagreed with the statement that "I search online new markets to find where I can sell my products or services". At the same time, (9.34%) were neutral and (6.9%) of the respondents agreed with the statement.

These results are not encouraging. The majority (83.78%) of women-owned SMEs in Kigali did not consider the Internet as a way to extend their markets. Regrettably, Table 34 (Appendix B), question 47 shows that (71.25%) of respondents reported lack of market as a constraint facing women-owned SMEs in Kigali.

A possible explanation of these results may be that women-owned SMEs in Kigali had the intention to use an Internet search to find a new market, but they lack ICT skills as shown in Table 34 (Appendix B), question 57 where (60.54%) stated that lack of ICT skills was a constraint. Sasakawa Peace Foundation (2017) reported that mobile application in Indonesia helped women entrepreneurs to monitor the market; they can buy inventory or sell products through a mobile phone application. The next section discusses the findings on the use of social media to advertise.

5.2.83 Advertising on social media

The statement posed to respondents was "I advertise my products or services online or on social media". The results presented in Table 44 (Appendix B), question 90 reveal that the mean score was 2.101 (which was less than 3), and the t-test analysis produced a t value = -16.355 (p=.000<.05). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of -16.355 was less than 0.05, the level of significance, and the alternative hypothesis that the mean score was less than 3 was accepted. This suggested that the respondents disagreed with the statement and the results in percentage indicate that (69.95%) of respondents disagreed. This result supports the T-test findings above. However, (15.03%) of respondents disagreed with the statement and (15.02%) were neutral. The fact that many women entrepreneurs in Kigali run small-sized businesses providing convenience products and common small services may be the reason for not advertising their products or services on social media. Communicating with stakeholders via email discussed next.

5.2.84 Online communication with networks

The statement was "I communicate with my networks via email to limit travel to meet face to face". The objective of the statement was to identify whether women-owned SMEs in Kigali use email to communicate with networks instead of traveling to meet them face to face. The results displayed in Table 44 (Appendix B), question 91 indicate the mean score was 1.94 (which was less than 3), and the t-test analysis produced a t value = -18.588 (p=.000<.05). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of -18.588 was less than 0.05, the level of significance, and the alternative hypothesis that the mean score was less than 3 was accepted. These findings suggest that the respondents disagreed with the statement that “I communicate with my networks via email to limit travel to meet face to face”.

Considering the percentage results, the same Table 44 (Appendix B), question 91 indicates that the majority of respondents (72.62%) disagreed with the statement, however, (13.94%) took a neutral position, while the minority of respondents, (13.45%) agreed with the statement.

These findings provide evidence of the T-test results above which also disagreed with the statement. A possible explanation for (72.62%) of respondents disagreeing may be that they were not familiarised with the use of the Internet to enable them to communicate and discuss business via email with their networks without travelling to meet them. However, the adoption of the Internet could help them to shift from travelling to online business communication. These findings are in line with the World Bank report that focused on preventing violence against women in transport systems (WB, 2016). The next section discusses the findings on communication via the cellphone.

5.2.85 Usage of a cellphone with networks communication

The statement "I discuss business on cellphone with my networks instead of traveling to meet them" was posed to determine to which extend women-owned SMEs in Kigali used a cellphone to discuss business with their networks instead of traveling to meet them.

The findings presented in Table 5.44, question 92 illustrate that the mean score was 2.81 (which was less than 3), and the t-test analysis produced a t value = -2.601 (p=.000<.05). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of -2.601 was less than 0.05, the level of significance, and the alternative hypothesis that the mean score was less than 3 was accepted.

These findings indicated that respondents disagreed with the statement and at the same time, Table 44 (Appendix B), question 92 illustrated that (45.47%) of respondents disagreed with the statement. In contrast, (40.83%) agreed with the statement, (13.67%) of respondents preferred a neutral position. These results confirm the T-test results.

The results were close, with (45.47%) who disagreed versus (40.83%) of respondents who agreed with a difference of (4.64%) in favour of disagreement. Therefore, the majority of (45.47%) of respondents travel to meet face to face with their networks. Conversely, (40.83%) of respondents discuss business with networks via cellphone. They did not need to travel as transactions are done via cellphone call. They save time,

money, and most importantly avoid incidents associated with travelling, for instance, robbery and sexual abuse. These findings are contrary with the UNCTAD: Empowering women entrepreneurs through Information and Communications Technologies: A practical guide who find that many women entrepreneurs use cell phone to contact the stakeholders instead to travelling to meet them physical (UNCTAD 2014).

5.2.86 Ordering stock online to ovoid travelling

The statement “I order my stock online to avoid travelling” was put forward to investigate whether women-owned SMEs in Kigali ordered inventory online to avoid travelling to suppliers. The findings presented in Table 44 (Appendix B), question 93 illustrate that the mean score was 1.579 (which was less than 3), and the t-test analysis produced a t value = -29.681 (p=.000<.05). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of -29.681 was less than 0.05, the level of significance, and the alternative hypothesis that the mean score was less than 3 was accepted. These findings suggested that the respondents disagreed with the statement that “I order my stock online”.

According to the same Table 44 (Appendix B), question 93, the findings demonstrate that an overwhelm (84.48%) of respondents disagreed with the statement that "I order my stock online to avoid travelling". At the same time, (9.11%) of the respondents were neutral, while (6.4%) of respondents agreed with the statement.

These findings confirm the T-test results above, which also disagreed with the statement. The results show that (84.48%) of women-owned SMEs in Kigali did not use the Internet to order stock from supplies in order to avoid travelling to buy physical stock. These findings contradict the study by Werber et al. (2015), who found that (50%) micro-enterprises in Kosovo bought online inventory.

5.2.87 Ordering inventory via cellphone

The statement "I order my stock via cell phone to avoid travelling" was aimed at determining whether women-owned SMEs in Kigali used a cellphone to order stock to avoid physical mobility to purchase inventory from suppliers. The findings are presented in Table 44 (Appendix B), question 94th and reveal that the mean score was

3.924 (which was more than 3), and the t-test analysis produced a t value = 15.988 (p=.000<.05). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of 15.988 was more than 0.05, the level of significance, and the alternative hypothesis that the mean score was more than 3 was accepted. These findings indicate that the respondents agreed with the statement that "I order my stock via cellphone to avoid travelling".

The results in Table 44 (Appendix B), question 94 reveal that over two-thirds of respondents, (79.41%) agreed with the statement that "I order my stock via cellphone to avoid travelling". Furthermore, (11.76%) of respondents disagreed with the statement and (8.82%) were neutral. These findings match with the T-test results in the previous paragraph. What is interesting in this data is that a considerable number (79.41%) of women-owned SMEs in Kigali adopted the cellphone into their business activities. They used a cellphone to order their stock instead of travelling to the suppliers.

Ordering inventory via cellphone had many benefits, including saving transport money, time, and avoiding sexual harassment, among others. Comparing these results with the previous results in Table 44 (Appendix B), question 93 indicates that women-owned SMEs in Kigali are likely to use a cellphone to order inventory more than using the Internet. This is supported by Adewoye et al. (2013) study which revealed that the cellphone was the most used ICT tool among women entrepreneurs in South Western Nigeria because it is easy to use, and it does not require the skill required for the Internet.

5.2.88 Searching the Internet for information against sexual abuse

The statement "I search for information on the Internet regarding rights against sexual abuse" was posed to discover whether women-owned SMEs used the Internet to search for information regarding rights against sexual abuse. The findings presented in Table 44 (Appendix B), question 95 demonstrate that the mean score was 2.015 (which was less than 3), and the t-test analysis produced a t value = -16.244 (p=.000<.05). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of -16.244 was less than 0.05, the level of significance, and the alternative hypothesis that the mean score was less than 3 was accepted.

This implied that the respondents disagreed with the statement that "I search for information on the Internet regarding right against sexual abuse". Similarly, Table 44 (Appendix B), question 95 illustrate that over two-thirds of respondents (76.17%) disagreed with the statement, (16.96%) of respondents agreed with the statement. In addition, (6.88%) of the respondents were neutral. These findings equal that of T-test in the above paragraph, which also disagreed with the statement.

These findings have shown that (76.17%) of respondents did not search for online information regarding their rights against sexual abuse. Comparing these findings with those of Table 34 (Appendix B), question 39, where the majority (43.6%) disagreed that sexual harassment was not a constraint experienced by women entrepreneurs in Kigali could explain why they did not search for information on the Internet regarding rights against sexual abuse. The next sections provide the findings on online public health information.

5.2.89 Online public health information

The statement “I search for information on the Internet regarding public health” was posed to investigate whether the respondents leverage the Internet to find information that can help them and their families keep healthy. The results presented in Table 44 (Appendix B), question 96 indicates the mean score was 2.20 (which was less than 3), and the t-test analysis produced a t value = -12.372 ($p=.000<.05$). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of -12.372 was less than 0.05, the level of significance, and the alternative hypothesis that the mean score was less than 3 was accepted. These results suggested that the respondents disagreed with the statement that "I search for information on the Internet regarding public health".

Equally, Table 44 (Appendix B), question 96 indicate that the majority (71.33%) of respondents disagreed with the statement which support the T-test results above. Furthermore, (22.55%) of the respondent agreed with the statement and at the same time, (6.13%) of respondents were neutral.

5.2.90 Searching online for HIV/AIDS information

The statement "I search for information on the Internet regarding HIV/AIDS infection." was presented to investigate whether women-owned SMEs leverage the Internet to know more about HIV/AIDS infection. The findings displayed in Table 44 (Appendix B), question 97 illustrate that the mean score was 2.47 (which was less than 3), and the t-test analysis produced a t value = -7.552 (p=.000<.05). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of -7.552 was less than 0.05, the level of significance, and the alternative hypothesis that the mean score was less than 3 was accepted.

This indicated that the respondents disagreed with the statement that "I search for information on the Internet regarding HIV/AIDS". Furthermore, the same Table 44 (Appendix B), question 97 demonstrate that (58.57%) of respondents disagreed with the statement which corresponds with the T-test results. Conversely, (29.66%) of respondents agreed with the statement and (11,76%) were neutral.

The majority (58.57%) of women-owned SMEs in Kigali did not leverage the Internet to seek information on HIV/AIDS. Considering the results presented in Table 34 (Appendix B), question 58 where (92.38%) of respondents agreed that HIV/AIDS was a constraint in running their SMEs, these women entrepreneurs should use the Internet to acquire information on HIV/Aids.

However, Ministry of Health integrated ICT in public health by creating an online platform where every citizen can access HIV/AIDS information through a smartphone, laptop, and tablet among other ICT devices (Rwanda. Ministry of Health, 2018). Lack of information and communication skills may be the reason they did not learn more about the HIV/AIDS as confirmed in Table 34 (Appendix B), question 57 that more than half (60.54%) of women-owned SMEs lack ICT skills.

5.2.91 Online information against bribery

The statement was “I search for information on the Internet regarding my right and punishment for giving and receiving a bribe.” The purpose of the statement was to investigate whether women-owned SMEs in Kigali search for online information

regarding their right and punishment for giving and receiving a bribe. The findings presented in Table 44 (Appendix B) question 98 indicate that the mean score was 1.96 (which was less than 3), and the t-test analysis produced a t value = -17.577 (p=.000<.05). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of -17.577 was less than 0.05, the level of significance, and the alternative hypothesis that the mean score was less than 3 was accepted. This suggests that the respondents disagreed with the statement that "I search for information on the Internet regarding my right and punishment for giving and receiving a bribe".

Consistently with the results in the same Table 44 (Appendix B), question 98 indicates that two-thirds of respondents (75.43%) disagreed with the statement. This result was also obtained in the T-test results. Furthermore, (13.27%) of the respondents agreed with the statement and (11.30%) chose a neutral option.

These results are not encouraging; most of the respondents, (75.43%), did not search online information regarding their right and sentence for receiving and giving bribe. However, Table 34 (Appendix B), question, 48 demonstrates that (58.87%) of respondents reported that they experienced bribery constraints among some public officials. Women-owned SMEs may benefit from equipping themselves with knowledge on dealing with bribery and corruption.

However, The Rwanda, Office of the Ombudsman provides online information regarding corruption and punishment. They should report any kind of corruption anonymously to rwanyaruswa@ombudsman.gov.rw (Rwanda. Office of Ombudsman, 2019). The following discussion relates to the findings on online information regarding public supply chain and competition.

5.2.92 Online information regarding public supply chain and competition

The statement "I search for information on the Internet regarding the public tender and how to compete within the markets" was put forward to determine whether women-owned SMEs search online information regarding the public tender process and how they can successfully compete. The findings are shown in Table 44 (Appendix B), question 99 and reveal that the mean score was 1.76 (which was less than 3), and the

t-test analysis produced a t value = -23.570 (p=.000<.05). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of -23.570 was less than 0.05, the level of significance, and the alternative hypothesis that the mean score was less than 3 was accepted.

This implied that respondents disagreed with the statement that "I search for information on the Internet regarding the public tender and how to compete within the markets". Meanwhile, the same Table 44 (Appendix B), question 99 shows that the vast majority of respondents (83.83%) disagreed with the statement that "I search for information on the Internet regarding the public tender and how to compete within the markets". This result provides evidence of the T-test result above that also disagreed with the statement. In contrast, (8.82%) of the respondents agreed with the statement and (7.35%) of the respondents were neutral. Many women businesses in Rwanda are micro and small businesses and are unlikely to compete for public tender in supply chain management. This may explain why women-owned SMEs in Kigali, were not interested in searching information on the public tender process. These findings are in line with (NISR, 2018) who found women entrepreneurs in Kigali less competitive in supply chain due to their small-scale enterprises. The next section discusses the findings on using the Internet to minimise transport cost.

5.2.93 Online information to limit transport cost

The statement "I search for information on the Internet on how to limit the transport cost" was to evaluate whether women-owned SMEs searched information on the Internet on how they can limit transport cost. The findings displayed in Table 44 (Appendix B), question 100 indicate that the mean score was 1.76 (which was less than 3), and the t-test analysis produced a t value = -24.533 (p=.000<.05). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of -24.533 was less than 0.05, the level of significance, and the alternative hypothesis that the mean score was less than 3 was accepted. This suggested that the respondents disagreed with the statement "I search for information on the Internet on how to limit the transport cost". Table 44 (Appendix B), question 100 also illustrated that a significant number of respondents (84.76%) disagreed with the statement and this confirms the results obtained in the T-test above. In addition, (8.11%) of respondents agreed with the statement and (7.1%) of respondents were neutral.

These results are not encouraging as the majority (45.97%) of women-owned SMEs in Kigali complained about high transport cost as indicated in Table 34 (Appendix B), question 50. Unfortunately, (84.76%) of women-owned SMEs in Kigali did not try the Internet to search for possible solutions. However, an Internet search engine provides vital information on different logistical ways an entrepreneur can use to obtain merchandises at a reasonable cost (Pienaar & Vogt, 2012).

A possible explanation may be that women-owned SMEs in Kigali may not have the skills to use the Internet to search for cheap freight brokers. Another possible explanation may be that the logistic system is still growing in Rwanda.

5.2.94 Online information to limit telecommunication cost

The statement "I search for information on the Internet on how to limit the communication cost" was intended to explore whether women-owned SMEs search for information online on how they can limit the telecommunication cost. The findings presented in Table 44 (Appendix B), question 101 demonstrates that the mean score was 1.83 (which was less than 3), and the t-test analysis produced a t value = -22.476 ($p=.000<.05$). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of -22.476 was less than 0.05, the level of significance, and the alternative hypothesis that the mean score was less than 3 was accepted. These results suggest that the respondents disagreed with the statement that "I search for information on the Internet on how to limit the communication cost".

Consistent with the percentage figure in the same Table 44 (Appendix B), question 101 the vast majority (80%) of respondents disagreed with the statement that "I search for information on the Internet on how to limit the communication cost". This provides evidence to the T-test result in the paragraph above. In addition, (8.14%) of respondents disagreed with the statement, while (11.85%) of the respondents were neutral. Table 44 (Appendix B), question 51 indicated that (50.25%) of respondents viewed high telecommunication cost as a constraint facing women entrepreneurs and therefore women-owned businesses should use the Internet to research how to limit these costs.

Perhaps, they are not familiar with mobile phone applications to download affordable communication application, for instance, VoIP and usage of Internet to cut cellphone calls cost as proposed by Voiproutes (2016) and Central (2018). The next finding focuses on sources of useful information.

5.2.95 Source of news, information, and counsel for business

The question "Where do you obtain the most useful news, information, and counsel for your business"? was posed to identify where women-owned SMEs obtained useful news. According to Table 45 (Appendix B), the respondents obtain most useful news, information, and counsel for their business using a cellphone (60.54%).

5.2.96 If you did any of the activities below within the last 12 months, please indicate which communication channel you used to carry out activities

The objective of the statement was to identify the communication channel women-owned SMEs used within the last 12 months in their business activities. Table 46 (Appendix B) and Figure 5.28 illustrate the percentage distribution of the communication channels respondents used to carry out various activities. Looking at the figure, it is clearly evident that for most of activities, the respondents used “calls”. For statement 103 (Receiving information regarding products or services) and 104 (Obtaining information about health; nutrition, diseases, public health), they mostly used Internet on a cellphone (40.79% and 40.59%) and calls (48.40% and 35.94%) respectively; for statement 105 (Communicate with the government, download form, complete form online, pay online, and register business, RRA), they mostly used a computer (43.73%) and Internet on a cellphone (43.24%); for statement 106 (send and receive emails) and statement 107 (Using Internet, Skype, WhatsApp etc.), they mostly used Internet on a cellphone (65.25% and 84.84% respectively); and for statement 112 (Sending/ receiving/ paying money) they mostly used SMS (49.26%) and calls (48.77%).

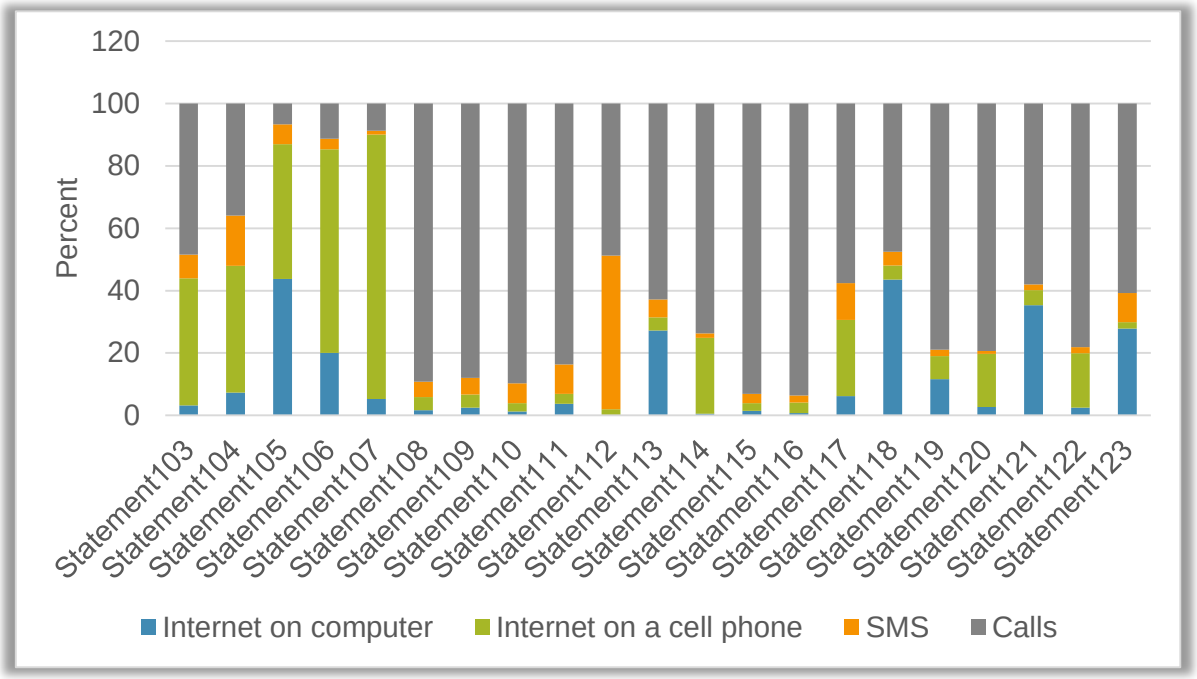

Figure 5.28: Communication channels

5.2.97 Indicate essential information to your business, but you do not obtain

The objective of the question was to identify the critical information needed by women-owned SMEs to improve their businesses despite them not achieving or obtaining it. Table 47 (Appendix B) and Figure 5.29 show the percentage distribution of the information judged important to the business by the respondents that they did not obtain. Looking at the figure, it is clear that the respondents need access to most of the information but did not obtain it. The majority of the respondents have easy access to "the legal rights of women regarding assets, property and employment" (statement 124) (88.75%) and the information of "where they can go to demand assistance to protect their assets, property and employment rights" (statement 125) (87.01%). Though some people need to access the information, a large number of respondents have easy access to the information of "Understanding the terms and conditions of the loan" (statement 134) (41.52%) and of "How to successfully apply for a loan" (44.09%).

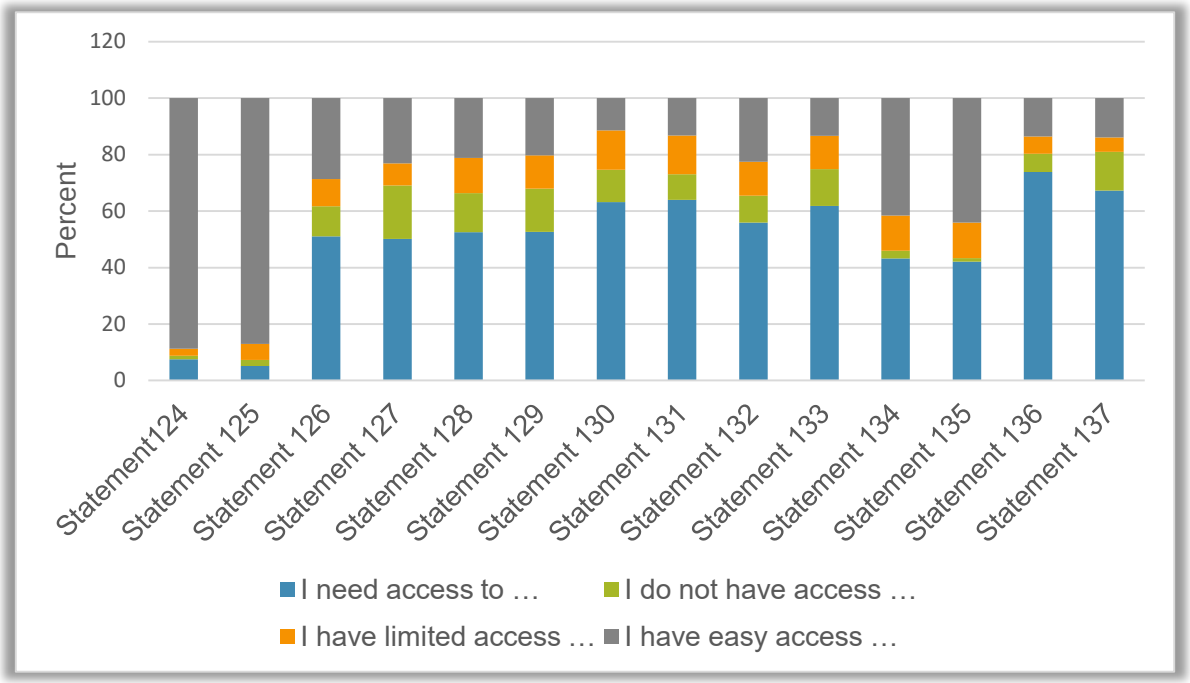

Figure 5.29: Important information not obtained

5.2.98 Receiving essential information through SMS

The question “Would you be happy to receive essential information through SMS on your mobile phone”? was posed to determine whether the respondents would be happy to receive relevant information through SMS on their cellphones. Table 48 (Appendix B) indicates that the majority of respondents (98.27%) would be happy to receive essential information through SMS on their mobile phones.

5.2.99 Website or mobile application useful for a business

The question “Do you know any website or mobile application useful for a business”? was presented to evaluate whether the respondents knew of any website or mobile applications useful for their business. According to Table 49 (Appendix B) and Figure 5.30, the majority of respondents (60.34%) indicated that they did not know any website or mobile application useful for their business.

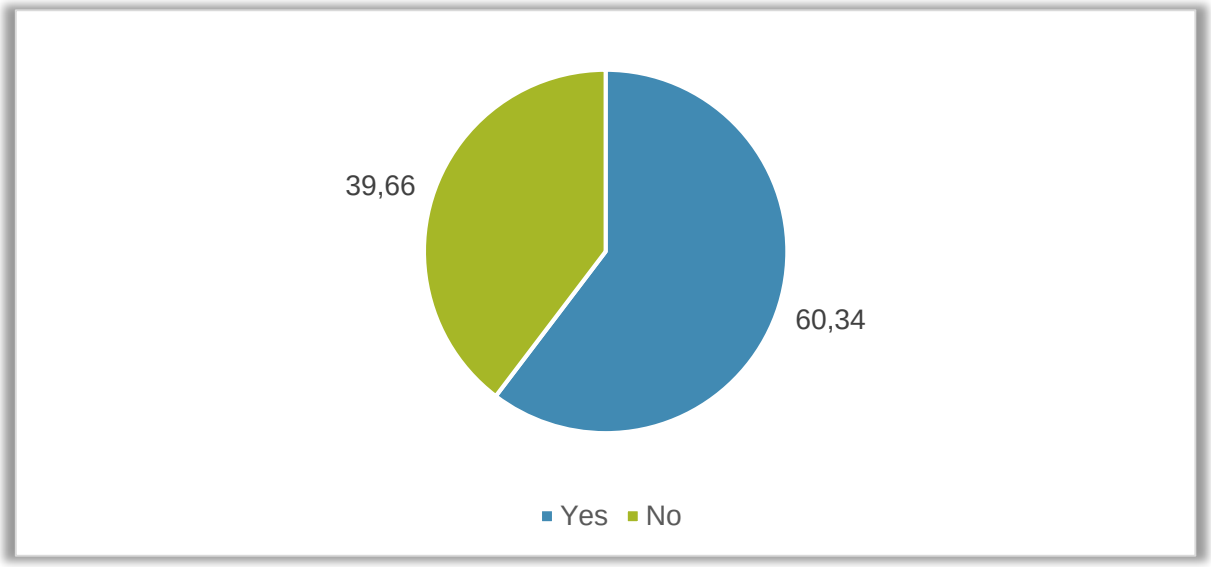

Figure 5.30: Knowledge of website or mobile application

5.2.100 Indicate your skills in an operating cellphone, computer, and the Internet

The purpose of the statement was to evaluate the skills of respondents to use a cell phone, computer, and Internet of things in their business. Table 50 (Appendix B) indicates that a large number of respondents can use various cellphone programs in their business (55.17%). Most of them wanted to learn more about how they can effectively use a cellphone (76.47%), a computer (86.49%) and the Internet (88.18%) in their businesses.

5.2.101 ICT training to improve business performance

The question was “Which ICT training do you need to improve your business”? was meant to identify specific ICT training that respondents could use to improve their businesses performance. According to Table 51 (Appendix B), a large number of respondents needed to learn about how cellphones may be more useful such as using it for money transfer, obtaining business information, advertising and finding new markets. The results indicated that (24.5%) of respondents needed to improve computer skills to be able to use accounting, inventory and bookkeeping software, etc. (32.1%), and to utilise more Internet in business for promoting products, selling online and creating a website (32.3%).

5.2.102 Methodology for training

The question “Which methodology do you want to use during training”? was put forward to identify the choice of methodology the respondents wish to use during the training. The findings presented in Table 52 (Appendix B) and Figure 5.31 indicate that the majority of respondents wanted a face-to-face training (76.04%).

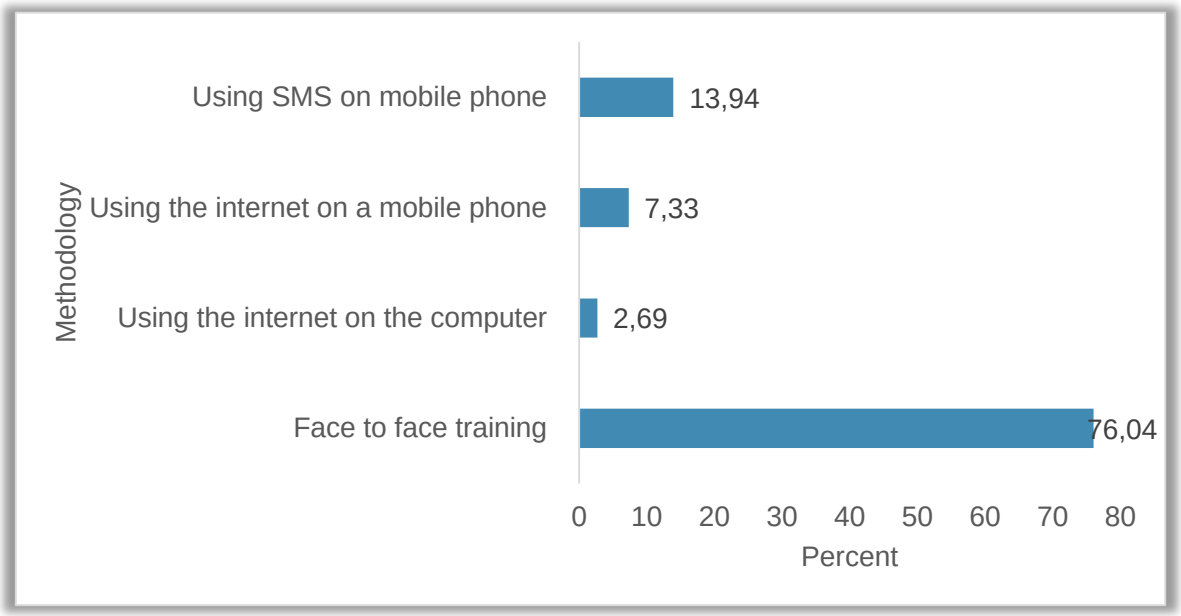

Figure 5.31: Methodology of training

SUMMARY OF THIS SECTION

The data was collected from 409 women-owned SMEs in Kigali. The objective of the section was to explore how ICT could intervene to find the solutions to constraints facing women entrepreneurs in doing small and medium business in Kigali, Rwanda. The majority had access to the Internet (79.8%) and using a cellphone (64.6%). The cellphone was the most used ICT tool (73.35%) in the business. At the same time, (55.15%) of respondents agreed that ICT improved their business performance and growth. In addition, the cellphone was identified as significant (60.54%) source of information needed in business. However, many respondents acknowledge a lack of computer literacy skills (86.49%) and the Internet (88.18%) that impacted on their business performance. Interestingly, (79.41%) of respondents ordered their inventory via cellphone instead of traveling to suppliers. The next section focusses on findings

regarding the role of stakeholders in encouraging the integration of ICT in women enterprises in Kigali.

SECTION 7: LEADERSHIP AND STAKEHOLDERS' ROLE TO PROMOTE THE USE OF ICT IN WOMEN-OWNED BUSINESSES

The previous section discussed the role ICT can play in women-owned businesses to mitigate or find solutions to constraints that they experience. This section responds to research question four. It investigates the role played by stakeholders in the integration of ICT use among women-owned businesses. To obtain the information, the following research question was addressed "Does Rwanda administration and stakeholders' information and communication technology policies support the successful integration and use of ICT in women-owned small and medium enterprises in Kigali, Rwanda"? The purpose of this section was to explore where the government and stakeholders' ICT policies support the successful integration and use of ICT in women-owned SMEs in Kigali, Rwanda.

This section incorporates 11 questions, from 151 to 161 as displayed in the questionnaire (See Appendix A). Nine questions are in the form of Likert scale; question 156 is a filter question; question 158 is multiple choice with possibility to more than one option, and question 159 is a dichotomous question.

As discussed in Chapter Four, the researcher collected quantitative survey data from 409 women-owned SMEs. SPSS and Stata analysed data and findings were presented in descriptive and T-test statistics in tables and charts. Table 53 (Appendix B) describes leadership and stakeholders' role to promote the use of ICT in women's businesses which cover question 151 to 155. These questions are in the form of a five-point Likert scale, strongly disagree 1, strongly agree 5 (See Appendix A). The question was "Does Rwanda administration and stakeholders' information and communication technology policies support the successful integration and use of information and communication technology in women-owned small and medium enterprises in Kigali, Rwanda"?

5.2.103 Leadership and stakeholders' role to promote the use of ICT in women's businesses

The question was "Does Rwanda administration and stakeholders' information and communication technology policies support the successful integration and use of information and communication technology in women small and medium enterprises in Kigali, Rwanda"? The objective is addressed in the paragraph above.

Table 53 (Appendix B) shows a percentage distribution for statements of leadership and stakeholders' role to promote the use of ICT in women's businesses that were measured on the Likert scale. According to the t-test results, the table indicates that the respondents agreed with all the statements except statement 152 (Government and stakeholders give some ICT privileges to women entrepreneurs that male counterparts do not have) for which they were neutral.

The results in the table were summarised. This section discusses each item in the table by looking at whether stakeholders encourage women-owned SMEs to adopt ICT.

5.2.104 Stakeholders inspire women-owned SMEs to use ICT in their businesses

The statement was "Government and stakeholders encourage women-owned business in Kigali to use ICT in their daily business activities". The objective of the statement was to identify whether government and stakeholders encourage women-owned SMEs in Kigali to use ICT in their daily business. The findings presented the opinions of respondents in Table 53 (Appendix B). The results in Table 53, question 151 indicates that the mean score was 3.65 (which was more than 3), and the t-test analysis produced a t value = 14.838 ($p=.000<.05$). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of 14.838 was more than 0.05, the level of significance, and the alternative hypothesis that the mean score was more than 3 was accepted. This implied that the respondents agreed with the statement that "Government and stakeholders encourage women-owned business in Kigali to use ICT in their daily business activities".

Furthermore, Table 53 (Appendix B), question 151 illustrates that the majority (63.48%) of respondents agreed with the statement that "Government and stakeholders encourage women-owned business in Kigali to use ICT in their daily business activities". However, almost a quarter (24.51%) preferred a neutral position. In contrast, the minority (12.01%) of respondents disagreed with the statement.

These results are consistent with the T-test results. These results are encouraging with (63.48%) of women-owned SMEs in Kigali enjoying the government and stakeholders' motivation to use ICT in their businesses. Stakeholders are aware that the adoption of ICT in women businesses could improve their business performance and productivity. Authors like Government of Rwanda (2001); Twahirwa (2014) stated that the growth and competitiveness of women enterprises rely on effective integration and use of ICT in women enterprises.

5.2.105 Stakeholders ICT privileges to women entrepreneurs

The statement “Government and stakeholders give some ICT privileges to women entrepreneurs that male counterparts do not have”. The objective was to investigate if government and stakeholders provide additional ICT benefits to women-owned SMEs in Kigali compared to their male counterpart entrepreneurs. Table 53 (Appendix B), question 152 revealed the opinions of respondents, indicating that the mean score was 3.08 (which was slightly more than 3), and the t-test analysis produced a t value = 1.286 ($p=.000<.05$). The null hypothesis that the mean score = 3 was not rejected because the P-value (0.000) for the t value of 1.286 was slightly greater than 0.05, the level of significance, and failure to reject the null hypothesis. These results suggested that the respondents were neutral with the statement "Government and stakeholders give some ICT privileges to women entrepreneurs that male counterparts do not have".

As illustrated in the Table 53, question 152, almost half (45.96%) of respondents agreed with the statement that "Government and stakeholders give some ICT privileges to women entrepreneurs that male counterparts do not have". In contrast, (36.36%) of respondents disagreed with the statement and (17.69%) of respondents were neutral. Despite these results, (45.96%) agreed versus 36.36% who disagreed, with a difference of (9.6%) in favour of an agreement with the statement. The T-test

suggested the neutral position of respondents on the item. The following discussion relates to women-owned SMEs' opportunities to access ICT products.

5.2.106 Opportunity to access ICT

The statement "The government gives the same chance to women and men entrepreneurs to access ICT products" was posed to determine whether government treats women and men entrepreneurs in the same way when it comes to accessing IT and ICT products. Women-owned SMEs in Kigali provided their views on the statement as displayed in Table 53 (Appendix B), question 153. Findings in the table, question 153 reveals that the mean score was 4.098 (which was more than 3), and the t-test analysis produced a t value = 25.066 ($p=.000<.05$). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of 25.066 was more than 0.05, the level of significance, and the alternative hypothesis that the mean score was more than 3 was accepted. This indicated that the respondents agreed with the statement that "The government gives the same chance to women and men entrepreneurs to access ICT products".

Similarly, Table 53 (Appendix B), question 153 indicates that the vast majority (81.67%) respondents agreed with the statement that "The government gives the same chance to women and men entrepreneurs to access ICT products". However, (10.51%) of respondents kept a neutral position on the statement. At the same time, the minority (7.82%) of respondents disagreed with the statement.

These results prove the T-test results above. These findings of women-owned SMEs having equal access to ICT products like men entrepreneurs, may help to understand the government's efforts to promote women access to ICT and implement gender equality. It is suggested that women access to ICT will accelerate the achievement of UN 2030 Agenda for Sustainable Development Goals 2030 (Rwanda. Ministry of Gender and Family Promotion, 2010; UN, 2016).

5.2.107 Chamber of women entrepreneurs and stakeholders training

The statement “Chamber of women entrepreneurs and stakeholders train women entrepreneurs on how to comply with the forms concerning the business (e.g., Register a business, import and export, RRA) using the Internet.” The purpose of this statement was to determine whether RCWE and stakeholders train women entrepreneurs on how to comply with the forms concerning the business (e.g., Register a business, import and export, RRA) using the Internet. The opinions of respondents were collected and presented in Table 53 (Appendix B) and illustrate that the mean score was 3.35 (which was more than 3), and the t-test analysis produced a t value = 6.868 (p=.000<.05). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of 6.868 was more than 0.05, the level of significance, and the alternative hypothesis that the mean score was more than 3 was accepted. This indicated that the respondents agreed with the statement.

Table 53 (Appendix B), question 154 indicates that (54.54%) agreed with the statement that “Chamber of Women Entrepreneurs and stakeholders train women entrepreneurs on how to comply with the forms concerning the business (e.g., Register a business, import and export, RRA) using the Internet". In addition, (25.55%) of respondents disagreed with the statement and (19.9%) of respondents were neutral. These results are consistent with the T-test results.

As the findings indicate, (54.54%) women-owned SMEs received training from RCWE and stakeholders to enable them to complete the forms required for running a business and paying taxes. As mentioned earlier in Table 4 (Appendix B), (76.9%) of women-owned SMEs have secondary education level or less. They may not have the skills to use ICT devices and the Internet of things to comply with the government's regulations, as many government services related to business is done online.

These trained women entrepreneurs may be those who have secondary schooling or less. As mentioned in the literature review, various stakeholders empowered women entrepreneurs in Kigali with relevant skills in ICT to ensure that they can effectively, and efficiency use ICT in their daily businesses’ activities (Muhura, 2017; Taarifa, 2019). The following findings discuss the ICT training organiser.

5.2.108 Chamber of women entrepreneurs and stakeholder ICT training

The statement was "Chamber of Women Entrepreneurs and stakeholder organise ICT training programme which enables women-owned business in Kigali to be more efficient and effective in doing business" and was posed to determine whether the Chamber of Women Entrepreneurs and stakeholders organise ICT training programmes which enable women-owned business to be more efficient and effective in doing business. The respondents provide their opinions on the statement and the findings are presented in Table 53 (Appendix B), question 155.

The results in Table 53 (Appendix B), question 155 illustrates that the mean score was 3.141 (which was more than 3), and the t-test analysis produced a t value = 2.551 ($p=.000<.05$). The null hypothesis that the mean score = 3 was rejected because the P-value (0.000) for the t value of 2.551 was more than 0.05, the level of significance, and the alternative hypothesis that the mean score was more than 3 was accepted. These findings suggested that the respondents agreed with the statement that "Chamber of Women Entrepreneurs and stakeholder organise ICT training programme which enables women-owned business in Kigali to be more efficient and effective in doing business".

Consistently, Table 53 (Appendix B), question 155 shows that almost half of respondents (44.94%) agreed with the statement that "Chamber of Women Entrepreneurs and stakeholder organise ICT training programme which enables women-owned business in Kigali to be more efficient and effective in doing business". Meanwhile, (36.54%) of respondents disagreed with the statement and (18.52%) of the respondents were impartial. These findings correspond with those of the T-test in the above paragraph.

These results were below expectation; the opinions among the respondents on the item were divided. The results showed that (44.94%) respondents agreed with the statement versus (36.54%) who disagreed with a difference of (8.4%) in favour. From these results, it can be argued that (44.94%) who agreed with the statement, participated in one or more training organised to empower women-owned SMEs in Kigali. GIZ (2019) reported that many women entrepreneurs applied to attend ICT

training programmes, but few of them were allowed. The frequency of training programmes will be discussed in the next section.

5.2.109 Frequency of training

This a filter question, only responded to by those (44.94%) respondents who agreed with the statement "Chamber of Women Entrepreneurs and stakeholders organise ICT training programmes which enable women-owned business in Kigali to be more efficient and effective in doing business." The statement was "If you agree or strongly agree to question 155, to which extent you can rate the frequency of training".

The objective of the statement was to determine the frequency of training offered to women-owned SMEs in Kigali by RCWE and stakeholders. A five-point Likert scale was used and respondents rated the statement. Likert scale variables were never 1; rarely 2; sometimes 3; very often 4, and always 5. Table 54 (Appendix B), question 156 presents descriptive statistical findings. The majority of respondents rated the frequency of training as “sometimes” (60.49%). This implies that the respondents did not always get the necessary training.

Table 54 (Appendix B) demonstrates that the majority of respondents (60.49%) reported that RCWE and stakeholders’ training occurred ‘sometimes’. Furthermore, (19.23%) of respondents stated that training rarely occurred and (8.74%) of respondents indicated that the training always happened. The results show that (8.04 %) of respondents share the same view that training occurred very often. Meanwhile, (3.25%) of respondents did not ever see RCWE and stakeholder organised training to empower women-owned SMEs in Kigali.

The results are not impressive, the fact that the majority (79.72%) of women-owned SMEs in Kigali were trained sometimes and rarely may affect their growth and competitiveness. Due to a lack of relevant skills these women entrepreneurs may lag behind their competitors. Regular training promotes the business performance, productivity, and sustainability (Kelley et al., 2017). The findings related to the importance of training is discussed in the next section.

5.2.110 Importance of training in improving business

Women-owned SMEs were asked to rate the importance of training in improving their ways of doing business. The objective was to identify the effect of training on business. A five-point Likert scale was used to gather the perceptions of respondents. The Likert scale variables were: not at all important 1; slightly important 2; important 3; fairly important 4, and very important 5.

According to Table 55 (Appendix B), most respondents rated the importance of improving their way of doing business as fairly important (33.33%), important (22.81%) and slightly important (28.32%). These findings are encouraging, despite different views from respondents. The majority of beneficiaries (65.41%) firmly acknowledged the effect of training on their business' performance.

These findings suggest that training can change and improve the way businesses are managed and run. After training and repositioning, businesses can improve their efficiency, effectiveness, performance, competitiveness, productivity, and market share. These findings are supported by Uwantege & Mbabazi, 2015; Kelley et al., 2017) who maintain that training contributes to increased business performance and sustainability. The following discussion relates to the training respondents attended.

5.2.111 Training attended

Respondents were asked to select one or more training they attended. The objective of the question was to identify the training the respondents attended. Table 56 (Appendix B) indicates that the respondents attended a variety of training. In order of importance, they for example, attended a training on "Access to finance" (19.4%), Bookkeeping (17.5%), and "Comply with government documents" (15.9%).

5.2.112 ICT competition among women-owned SMEs in Kigali

Women-owned SMEs in Kigali were asked "Is there an ICT competition among women-owned business in Kigali and awards for the best winner"? The objective of the question was to identify the existence of ICT competitions among women-owned

businesses in Kigali and awards for the best winner. Two options, yes and no, were presented. Descriptive statistical findings are displayed in Table 57 (Appendix B).

The majority answered “Yes” (82.78%) to this question, that there is an ICT competition among women-owned business in Kigali and awards for the best winner. It is interesting to note that ICT competition increases women-owned SMEs skills in ICT and their ability to use different software in their business. In addition, it is a strong move to the fourth industry revolution which requires ICT skills to compete in the market, promoting artificial intelligence and technology which drives innovation and sustainability of the business.

5.2.113 Internet network coverage

The question was “How do you rate the Internet network coverage in your business area”? The purpose of the question was to determine the rate of Internet network coverage in Kigali. A five-point Likert scale was used to rate the item. The rating variables were: very poor 1; poor 2; fair 3; good 4, and very good 5. Descriptive statistical findings are presented in Table 58 (Appendix B).

Internet network coverage was rated mostly as “Good” (51.34%), “Fair” (25.18%) and “Very good” (19.8%). These findings are interesting with (96.32%) of women-owned SMEs expressing satisfaction with Internet connectivity in Kigali. This allows them to conduct their business online without fear. Broadband Internet in Kigali is known as good quality and is among the best in the Eastern community. These findings share similarities with the report by The United Nations Office of the High Representative for the Least Developed Countries Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS), 2017). In the next section, findings relating to mobile network coverage are discussed.

5.2.114 Mobile phone network coverage in Kigali

The question was “How do you rate mobile phone network coverage in your business area”? The objective of the question was to identify the rate of mobile phone network coverage in Kigali. A five-point Likert scale was used. The rate measures were: very poor 1; poor 2; fair 3; good 4, and very good 5. Descriptive statistical findings are

presented in Table 59 (Appendix B). Mobile phone network coverage was rated mostly as “Very good” (66.42%) and “Good” (26.23%). Remarkably, these findings revealed that (99.75%) women-owned SMEs in Kigali are satisfied with the quality of cellphone network coverage in Kigali. These businesses are able to communicate with the networks free of interruptions. Many reports affirm these findings on good mobile phone network coverage (UN-OHRLLS, 2017; Broadband Commission for Sustainable Development, 2018; BuddeComm, 2019).

SUMMARY OF THIS SECTION

In summary, the study found that almost all (99.75%) of women-owned SMEs in Kigali were happy with the cellphone connection network in Kigali. In addition, (96.32%) of women-owned SMEs in Kigali shared positive sentiments on Internet connectivity in Kigali. At the same time, (65.41%) of respondents enjoyed the effect of training on their businesses. At the same time, the vast majority (81.7%) women-owned SMEs in Kigali reported having the same rights as men in terms of access to ICT products. Meanwhile, (82.78%) surveyed reported the existence of an ICT competition among women-owned business in Kigali and awards for the best winner. Thus, the majority of (63.48%) of respondents stated that stakeholders encourage women-owned business in Kigali to use ICT in their daily business activities. However, the majority of respondents, (60.49%) reported that training happened sometimes. The next section introduces reliability tests.

5.3 Reliability tests

The reliability of the construct was measured using the alpha coefficient of Cronbach, where alpha coefficients 0.70 or higher were approved. Cronbach's alpha is a measure of the variance within an element and the covariance between a given item and every other item on the scale (Thorndike et al., 1991; Field 2009). All the values of the Alpha coefficient were above 0.7 except one, which suggests that the data are accurate. It should be remembered that the reliability tests were not carried out due to financial constraints and own fear, since data were too few.

5.3.1 Gender Inequalities

Table 60 and 61 (Appendix B) shows the reliability statistics of the gender inequalities construct. Looking at the table of correlations, it is interesting to note that the last two items or questions are negatively correlated with the others. This is an indication that they should not have been combined with the others to form the construct in the first place. Seemingly, they do not belong to the construct. It should be noted that the variables which correlate negatively with others also have a negative sign, unlike others, which are positive.

This implies that these items (5 and 6) should be removed from the construct. All the alpha coefficients and even the test scale (0.650) are less than 0.7 the cut-off point for acceptable reliability of a measured construct; and nothing can be done (for example by removing an item) to increase it. This means that the interpretation of the results with regards to gender inequalities should be done with caution.

5.3.2 Government Constraints

Table 62 and 63 (Appendix B) shows the reliability statistics of government constraints construct. Referring to the correlation matrix, almost all the coefficients of correlation between the variables are statistically significant. Item 2 (i.e., government constraint) has negative correlation with items 6, 7, 8, 9 and 10. This is an indication that this item or question does not belong to this construct. Item two which correlates negatively with some of the other items also has a negative sign, unlike others, which are positive. This implies that this item should be removed from the construct. All the alpha coefficients and even the test scale (0.771) are higher than the cut-off point (0.7) for acceptable reliability of a measured construct. This means that the reliability of this construct is acceptable.

5.3.3 Skills Constraints

Table 64 and Table 65 (Appendix B) shows the reliability statistics of the skills constraints construct. The correlation matrix shows that all the correlations between the items are statistically significant at the 5% level and are all positive. This augurs well for the construct. The overall reliability of the construct of skills constraints is 0.842,

which is higher than 0.7, and all the alpha coefficient estimates are above 0.7 and are all positive. This is good for the construct for it implies that the reliability of the construct is acceptable.

5.3.4 OnLine Access

Table 66 and Table 67 (Appendix B) shows the reliability statistics of the online access construct. Referring to the correlation matrix, almost all the correlation coefficient estimates are statistically significant at the 5% level and are all positive. This augurs well for the construct. The overall reliability of the construct of online constraints is 0.942, which is higher than 0.7, and all the alpha coefficient estimates are above 0.7 and are all positive. This is good for the construct as it implies that the reliability of the construct is acceptable.

5.3.5 Support

Table 68 and Table 69 (Appendix B) shows the reliability statistics of the support construct. The correlation matrix shows that all the correlation coefficient estimates are statistically significant at the 5% level and are all positive. This augurs well for the construct. The overall reliability of the construct of skills constraints is 0.827, which is higher than 0.7, and all the alpha coefficient estimates are above 0.7 and are all positive. This is good for the construct as it implies that the reliability of the construct is acceptable.

5.4 Test for normality

Many modern statistical analyses include the presumption of normality. Skewness and kurtosis tests are used to evaluate whether or not the variable is naturally distributed (see Table 5.1). For normality, skewness should be near zero, i.e. between-1 and +1. (George & Mallery, 2010); Furthermore, kurtosis should be between-3 and +3 (McNeese, 2016). The skewness and kurtosis of the dependent variable were-1,323 and 4,208 accordingly. It suggests that the EP was not normally distributed. This claim is backed by the normality test below.

Table 5.1: Skewness/Kurtosis tests for Normality

Variable	No. of Observations	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2) (Joint)	Prob> chi2
EP	403	0.000	0.001	66.74	0.000

In this study both Kolmogorov-Smirnov (K-S) and the Shapiro-Wilk test were used to assess if the sample data are normally distributed. The null hypothesis to be tested was:

H_0: The sample data is NOT significantly different from a normal population.

H_1: The sample data is significantly different from a normal population.

The findings of the Kolmogorov-Smirnov (K-S) and Shapiro-Wilk experiments are shown in Table 5.2. A likelihood of 0.05 or less for any figure means that the data is not usually distributed.

Table 5.2: Test for normality

Variable	No. of Observations	W	V	Z	**Prob >Z**
Entrepreneurial performance (EP)	403	0.939	16.923	6.733	.000

The Shapiro-Wilk test shows that the data was not usually transmitted. It means that H_0 was rejected at a significance level of 0.05 per cent (.000 < 0.05) and H_1 was accepted for the variable. Figure 5.32 displays the distribution plot for the variable.

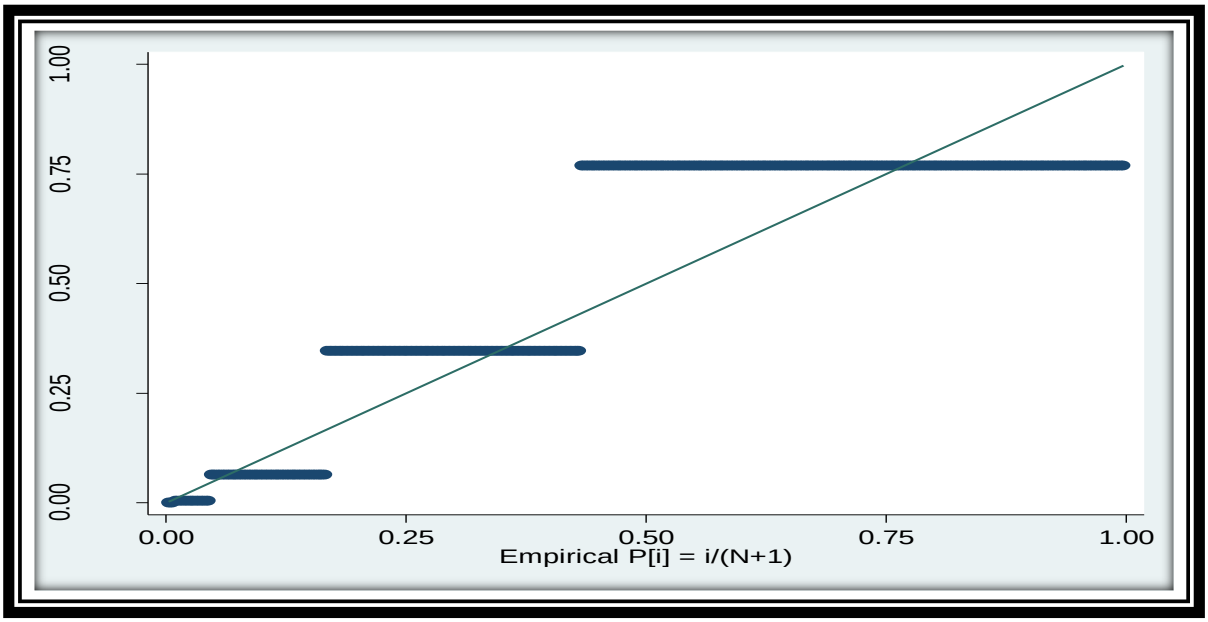

Figure 5.32: Distributional plot

The plot indicates that because all the points do not lie on the straight line, the variable (EP) is not normally distributed.

Factor analysis using the Principal Component Approach used in this study; but, it does not include the distribution of objects or sub-constructs as a general rule (Bentler & Chou, 1987). However, normality is required as a basic assumption for the SEM analysis to be carried out (Byrne, 2010). This explains that the distribution of the data should be normal distribution with mean=0, standard deviation=1 and a symmetric bell-shaped curve.

Typically, skewness and kurtosis values are tested in such a manner that the skewness value is near the range ±1 for normal distribution, and the kurtosis value was below the range ±3 for normal distribution. However, unless the deviation from normality is substantial, SEM can still be right for non-normal data (Bentler & Chou, 1987; Reinartz et al., 2009). A breach of the normality principle could be necessary.

5.5 Inferential data analysis

5.5.1 Logistic Regression

5.5.1.1 Entrepreneurship: Entrepreneurial performance (Used as a proxy for entrepreneurship)

For this study, the binary variable Entrepreneurial performance (1=performing well, 0=not performing well) is predicted by type of industry with 2 categories (1=Not Service Industry; Service Industry being the reference category); and capital with two categories (1= RwF 500 000 or more; Less than RwF 500 000 being the reference category). See Table 5.3 and Table 5.4 respectively for fitted model and logistic regression of entrepreneurial performance.

Table 5.3: Fitted model of entrepreneurial performance

Logistic regression	Number of obs = 397
	LR chi2(2) = 4.39
	Prob > chi2 = 0.1113
Log likelihood = -268.58361	Pseudo R2 = 0.0081

Table 5.4: Logistic regression of entrepreneurial performance

	B	**S.E.**	**Prob.**	**Odds ratio**
Constant	.466	.210	.026	1.594
Capital	-.000	.225	1.000	1.000
Industry	-.439	.210	.037	.644

That is:

ln(odds(Entrepreneurial activity)) = .466 -.00001 (Capital= RwF 500 000 or more) -.439 (Industry = Not Services Industry) (.210) (.225) (.210)

Note: the standard errors of the coefficients are in brackets.

In the logistic model, only type of industry (P=0.037<.05) is significant at the 5% level of significance. The Pseudo R square statistic of 0.008 indicated that about 0.8% of the variation in the dependent variable is explained by the model. The value of Logistic Regression (LR) Chi-square of 4.38 (P=.111) means that we should not reject the null hypothesis that all of the predictor effects are zero. The parameter estimate for a category of a dummy variable refers to the change in log odds when the dummy=1, compared to the reference category equalling 1 (being present). The odds ratio for other industries, other than Services (.644) is less than that of the Services industry – implying that entrepreneurs in the services industry are significantly more likely to perform well than in the other industries.

5.5.1.2 Entrepreneurial business growth (used as a proxy of entrepreneurship)

The fitted model of entrepreneurial business growth as well the logistic regression displayed correspondingly in Table 5.5 and Table 5.6 below.

Table 5.5: Fitted model of business growth

Logistic regression	Number of obs. = 402
	LR chi2(2) = 13.70
	Prob > chi2 = 0.0011
Log likelihood = -138.16565	Pseudo R2 = 0.0472

Table 5.6: Logistic regression of business growth

	B	S.E.	Prob.	Odds ratio
Constant	1.281	.264	.000	3.601
Capital	1.181	.317	.000	3.260
Industry	.051	.327	.876	1.052

That is:

ln(odds(Entrepreneurial activity)) = 1.281 + 1.181 (Capital= RwF 500 000 or more) + .051 (Industry = Not Services Industry) (.264) (.317) (.327)

In the model, only type of industry (P=0.037<.05) is significant. The Pseudo R square statistic of 0.008 indicated that about 0.8% of the variation in the dependent variable is explained by the model. The value of LR Chi-square of 4.38 (P=.111) means that we should not reject the null hypothesis that all of the predictor effects are zero. In the logistic model, only capital (P=0.000<.01) is highly significant at the 1% level of significance. The Pseudo R square statistic of 0.0472 indicated that about 4.7% of the variation in the dependent variable is explained by the model. The value of LR Chi-square of 13.70 (P=.0.001) means that we should reject the null hypothesis that all of the predictor effects are zero.

The parameter estimate for a category of a dummy variable refers to the change in log odds when the dummy=1, compared to the reference category equalling 1 (being present). The odds ratio for capital = RwF 500 000 or more (3.260) is higher than that of capital of less than RwF 500 000 – implying that entrepreneurs with more capital are significantly more likely to perform better than those with less capital.

5.5.1.3 Access to Internet/use of Internet and constraints

The Table 5.7 shows how the fitted model of access to Internet/use of Internet and the following constraints: gender, financial, government, and skills constraints and the support women-owned SMEs in Kigali receive integration of ICT into their SMEs. While, Table 5.8 displayed the logistic regression of the variables mentioned in paragraph.

Table 5.7: Fitted model of access to Internet

Logistic regression	Number of obs	=	352
	LR chi2(5)	=	84.06
	Prob > chi2	=	0.0000
Log likelihood = -134.94176	Pseudo R2	=	0.2375

Table 5.8: Logistic regression of access to Internet

	Odds Ratio	Std. Err.	Z	**Prob.**	[95% Conf. Interval]
Constant	.001	.001	-5.40	0.000	.000 - .009
Gender constraints	.988	.414	-0.03	0.979	.436 -2.245
Financial constraints	.913	.214	-0.39	0.697	.577 - 1.444
Govt. constraints	3.663	1.693	2.81	0.005	1.481 - 9.062
Skill constraints	1.047	.285	0.17	0.866	.614 - 1.785
Support	1.358	.066	6.31	0.000	1.235 - 1.494

5.5.1.4 Logistic Regression for Use of Internet

For this regression analysis, Use of Internet was coded as follows:

Yes = 1

No = 0

The results were illustrated in Table 5.9 and 5.10.

Table 5.9: Logistic regression for use of Internet

Logistic regression	Number of obs.	=	352
	LR chi2(2)	=	84.06
	Prob > chi2	=	0.0000
Log likelihood = -134.94176	Pseudo R2	=	0.2375

Table 5.10: Logistic regression for use of Internet, constraints and policies

	B	**S.E.**	**Prob.**	**Odds ratio**
Constant	-7.443	1.377	.000	.024
Gender constraints	-.011	.418	.979	1.197
Financial constraints	-.091	.234	.697	.798
Government constraints	1.298	.462	.005	4.587
Skills constraints	.046	.272	.866	1.152
Policies support	.306	.049	.000	

That is:

ln(odds(Access to Internet/Use of Internet)) = -7.443 -.011 Gender constraints - .091
(.418) (.234)
Financial constraints +

1.298 Government constraints + .046 Skills constraints + .306 Policies support
(.462) (.272) (.049)

H_0: There is no relationship between the constraints and Use of Internet.

H_1: There is a relationship between the constraints and Use of Internet.

H_0: There is no relationship between stakeholders' ICT initiatives and effective integration and Use of Internet.

H_1: There is a relationship between stakeholders' ICT initiatives and effective integration and Use of Internet.

The p-value for Government constraints is less than 0.05, then we reject the null hypothesis, and accept the alternative hypothesis that there is a relationship between the constraints and Use of Internet. For a unit increase in Government constraint, we expect the log of the odds of the outcome (i.e., Use of Internet) to decrease 1.298 units, holding all other variables constant. This implies that Government constraints decrease the access to Internet of women entrepreneurs.

For instance, in terms of telecommunication which is one of government constraints, authors like The New Times (2013) and Muvunyi (2017) agreed that the high cost of telecommunication in Rwanda impede access to Internet particularly for women. The findings provide evidence that the majority of respondents (50.25%) in Table 34, question 51 (Appendix B) complained about higher communication cost.

Therefore, hypothesis 3 (**H_3**) cited in literature: The hypothesis that there is a negative relationship between the constraints faced by women-owned businesses in Kigali, Rwanda and the use of Internet in women businesses to find a solution to those constraints was accepted.

The p-value for stakeholders' ICT initiatives and effective integration is less than 0.05, then we reject the null hypothesis, and accept the alternative hypothesis that there exists a relationship between stakeholders' ICT initiatives and effective integration and Use of Internet. For a unit increase in stakeholders' ICT initiatives and effective integration, we expect the log of the odds of the outcome (i.e., Use of Internet) to increase .306 units, holding all other variables constant. This implies that stakeholders' ICT initiatives and effective integration affects the Use of Internet by women entrepreneurs.

The literature indicates that stakeholders such as government, RCWE, PSF, International Trade Center's and SheTrades provide various ICT support to women entrepreneurs in Kigali including training, online networking and access to international market via Internet among others (Bishumba, 2017; Kaliisa, 2019).

Hence, Hypothesis 4 (**H_4**) cited in literature: There is a positive relationship between stakeholders' ICT initiatives and effective integration and use of ICT in women

enterprises in Kigali, Rwanda in order to ensure women businesses competitiveness was accepted.

But, Hypothesis 2 (**H_2**) There is a negative relationship between the constraints faced by women-owned businesses in Kigali, Rwanda and the management of small-sized enterprises was not tested due to lack of data.

Concerning hypothesis 1 (**H_1**) also generated from the literature review and cited as: There is a positive relationship between motivation and new women enterprises creation in Kigali, Rwanda was tested and accepted (see Table 5.15). The variable "Permission", which is one of the significant variables in the regression model shown in Table 5.15 is a component of section 4 of "the motivation for women-owned enterprises in Kigali, Rwanda to start a business". In the table, Permission 7 (i.e., Coef. = -.542, prob. = 0.023<0.05); this implies that "husband support" positively affects new women enterprise creation in Kigali, Rwanda. By implication, motivation is positively related to new women enterprise creation in Kigali.

5.5.2 Factor analysis

This sub-section discusses the findings of the factor analysis performed to minimize the dimensionality of each collection of items (i.e., the set of questions about OnLine Access and Support) in order to remove as few variables as possible while also describing a significant percentage of variation in the initial set of items. Typical explanations why construct validity could be at risk include an improper selection of items, insufficient sample size, the calculation performed in too few ways, the calculation performed with too few measuring variables or objects, too much data variance, improper selection of target subjects or limited sample sizes, complicated interaction across constructs, respondents providing bias or attempting to respond (O'Leary-Kelly & Vokurka, 1998).

Factor analysis was conducted by analysing the pattern of associations between the observed variables, and the indicators that were strongly correlated (either positively or negatively) were likely to be affected by the same underlying influences. In contrast, those that were comparatively uncorrelated were likely to be influenced by different factors. The definition of variation stated has been applied. The researcher used the

concept of having enough variables to account for at least 50% of the data heterogeneity, while the aim was to stress parsimony (explaining variance with as few factors as possible). Until removing questions that make up a predictor but describe very little additional information, the researcher tested the association with the dependent variable. A factor composed of a small number of items might have a strong association with the dependent variable, therefore, it should not be decreased.

The Kaiser-Meyer - Olkin (KMO) test was used for factor analysis to assess sampling adequacy. It is a measure used to equate the magnitude of the actual correlation coefficients with the magnitude of the partial correlation coefficients (IBM Corporation, 2019). For a sufficient factor analysis to continue, the KMO value should be greater than 0.5. Great values for the KMO calculation imply that the study of the variables is warranted. The Bartlett Sphericity Test is used to assess the null hypothesis that the variables in the population correlation matrix are not correlated. In order to comply with the EFA, the P-VALUE of the test (i.e. that the items are correlated should be rejected) otherwise there is multicollinearity. In addition, confirmatory factor analysis (CFA) was conducted on every key construct to test its validity. This was done to verify the factor structure of the set of observed variables that constituted the construct.

For Bartlett test, the null hypothesis to be tested is as follows (see Table 70) in Appendix B):

H_0: Variables are not intercorrelated

H_1: Variables are intercorrelated

Stata's "factortest" command was used to perform Bartlett's test for sphericity and calculated the Kaiser-Meyer-Olkin Measure of Sampling Adequacy. Both tests should be used prior to a factor or a principal component analysis. Bartlett's test of sphericity tests the hypothesis that your correlation matrix is an identity matrix, which would indicate that your variables are unrelated and therefore unsuitable for structure detection. Bartlett's test of sphericity tests the hypothesis that your correlation matrix is an identity matrix, which would indicate that your variables are unrelated and therefore unsuitable for structure detection. Small values (less than 0.05) of the significance level indicate that a factor analysis may be useful with your data.

The Kaiser-Meyer-Olkin Measure of Sampling Adequacy is a statistic that indicates the proportion of variance in your variables that might be caused by underlying factors. High values (close to 1.0) generally indicate that a factor analysis may be useful with your data. If the value is less than 0.50, the results of the factor analysis probably would not be very useful. Taking this into consideration, these tests provided the minimum standard to proceed for Factor Analysis.

Test hypothesis regarding interrelationship between the variables was:

Null Hypothesis H_0: There is no statistically significant interrelationship between variables affecting Entrepreneurial performance.

Alternate Hypothesis H_1: There may be a statistically significant interrelationship between variables affecting Entrepreneurial performance.

Bartlett's sphericity of various values with prob. =.000<0.01 suggested that the factor analysis procedure would result in a more parsimonious number of factors. For "Own fear" Chi-square value = 0.128 (prob. =0.721>.05), meaning that factor analysis was not suitable. Principal Component Analysis (PCA) with Varimax rotation had a KMO ranging between 0.500 (for Own fear) and 0.943 (for Online Access). For "Own fear", KMO = 0.500, also suggesting that the procedure would not result in a more parsimonious number of factors. Also, for the overall constraints construct, the statistics indicate that it was advisable to subject the data to factor analysis.

The principal component method was used to extract the common factors from the correlation matrix. The extraction was based on the scree plot, Eigenvalue of at least one, with a percentage cumulative extraction sum of squared loadings of at least 50% to be extracted from the data. Apart from the eigenvalues, the results of factor analysis report the proportion of variation extracted by the factor, the cumulative proportion of the variation extracted and the uniqueness of each item. Uniqueness gives the proportion of the common variance of the variable not associated with the factors; it equals to 1 – communality. Comunality is the proportion of the common variance of the variable which is associated with a factor.

5.5.2.1 Constraints

The scree plot (See Figure 5.33) shows very clearly that only two or three common factors with a percentage cumulative extraction sum of squared loadings of 50.98%, should be extracted.

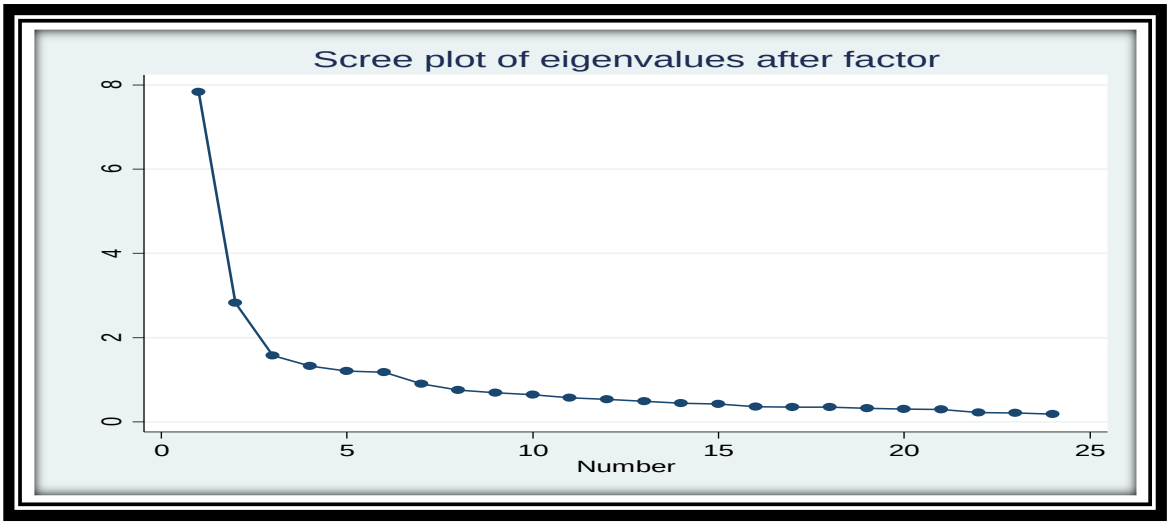

Figure 5.33: Scree plot of constraints

Rotated factors were used (See Table 5.11). Rotation is an attempt to describe the information in several factors by reexpressing them so that loadings on a few variables are as large as possible, and loadings on the rest of the variables are as small as possible. This helps us to interpret the results better or more easily. If the rotated factors were not any better than the unrotated ones, the unrotated factors were used.

Table 5.11: Factor analysis/correlation

Factor analysis/correlation			Number of obs. =	366
Method: principal-component factors			Retained factors =	2
Rotation: (unrotated)			Number of params =	47
Factor	**Eigenvalue**	**Difference**	**Proportion**	**Cumulative proportion**
Factor1	7.83457	5.00560	0.3264	0.3264
Factor 2	2.82897	1.25647	0.1179	0.4443
Factor3	1.57250	0.24888	0.0655	0.5098
……				

However, because some items were sharing a factor almost equally, two factors were used. LR test of independent vs. saturated: chi2(276) = 4283.45 Prob>chi2 = 0.0000 indicated that the model does not fit the data that well. With two factors, a percentage

of 44.43% of cumulative extraction of the sum of squared loadings was extracted. See Table 71 and 72 (Appendix B).

The following items or questions (See Table 5.12) were excluded because they were loaded almost equally on both factors – to address discriminant validity and avoid collinearity among the independent variable, which would affect the regression analysis negatively.

Table 5.12: Factor analysis/ correlation excluded questions

Variable	Label	Gender Inequality Factor	Government Constraint Factor
Financial_const2	Short term to pay back the loan is a constraint	0.4298	0.5257
Financial_const3	Collateral to obtain a loan is a constraint	0.4416	0.5701
Government_const4	High taxes is a constraint	0.4850	0.4010

The following item was included in the SEM alone because it did not contribute to any of the two factors significantly, rather it had its own factor:

Government constraint 5: Lack of market opportunities is a constraint. This was therefore treated as a variable that could affect the dependent variable.

5.5.2.2 Online Access

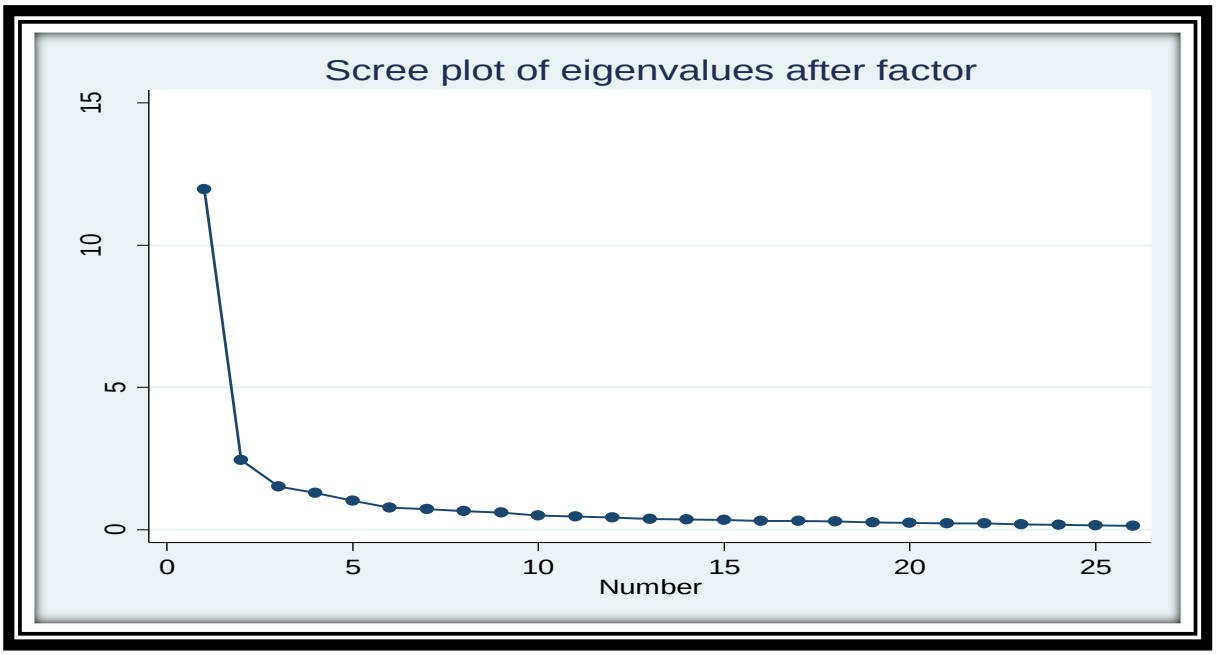

Figure 5.34: Scree plot of online access

One factor was retained for “Online constraints”. See results in Table 5.13 and 5.14.

Table 5.13: Factor analysis/correlation of online constraints

Factor analysis/correlation = 370	Number of obs
Method: principal-component factors = 1	Retained factors
Rotation: (unrotated) params = 26	Number of

Table 5.14: Retaining factors

Factor	Eigenvalue	Difference	Proportion	Cumulative proportion
Factor1	11.96932	9.51774	0.4604	0.4604
Factor 2	2.45158	0.93990	0.0943	0.5547
Factor3	1.51168	0.22003	0.0581	0.6128
……				

The LR test of independent vs. saturated: chi2(325) = 7006.40 Prob>chi2 = 0.0000 indicated that the model does not fit the data that well. Using the criteria of retaining

factors, only factor was retained; and with one factor, a percentage of 46.04% of cumulative extraction of the sum of squared loadings was extracted. See Table 73 (Appendix B). The following items were included in the SEM alone – because they did not contribute to the factor significantly, rather it had its own factor:

OnLine access17: I discuss business on a cellphone with my networks instead of traveling to meet them.

OnLine access19: I order my stock via cellphone

These were therefore treated as variables that could affect the dependent variable.

5.5.2.3 Support

Figure 5.35 indicated the scree plot of support received by women-owned SMEs in Kigali with regard to ICT adoption. However, two factors were extracted. This is evident in Table 74 (Appendix B).

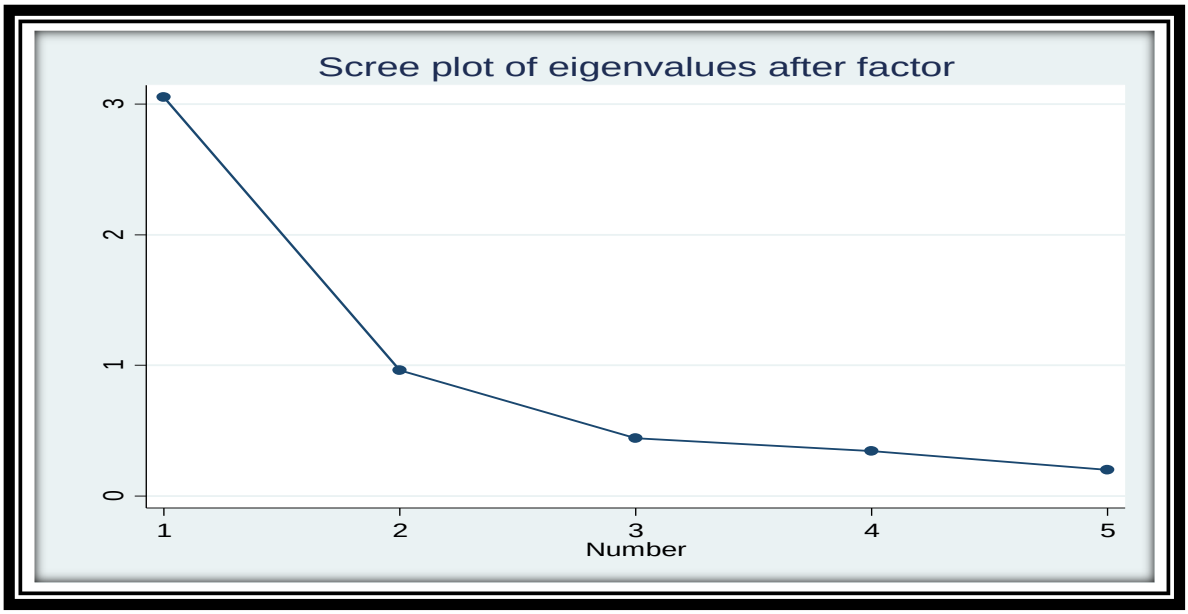

Figure 5.35: Scree plot of support

5.5.3 Structural Equation Modelling

The last objective (5) in this study was to develop a model that could be used to improve the performance, efficiency, effectiveness and competitiveness of women enterprises in Rwanda and other developing countries. The construct of the model is discussed below.

Structural equation modelling is used to analyse structural relationships. This research technique is the combination of factor analysis and multiple regression analysis. It is used to analyse structural relationships between measured variables and other measured variables or latent constructs. So, structural equation modelling, apart from being used to develop the model, was also used to test the study hypothesis. Entrepreneurial performance was the dependent variable of the structural model. According to Serumaga-Zake (2016), the way structural equation modelling (SEM) works is as follows:

- You state the way that you believe the variables are inter-related, often with the use of a path diagram;
- You work out, via some internal rules, what the implications of this are for the variances and covariance of the variables;
- You test whether the variances and covariance fit this model of them;
- The results of the statistical testing, and also parameter estimates and standard errors for the numerical coefficients in the linear equations are reported; and
- You decide whether the model seems like a good fit to your data.

As described above, SEM allows the researcher to perform some type of multilevel regression on factors. SEM can conceptually be used to answer any research question involving the indirect or direct observation of one or more independent variable or one or more dependent variables. However, the primary goal of SEM is to determine and validate a proposed causal process and/or model.

Therefore, SEM is a confirmatory technique. In this study, seven common measures of model fit were chosen as shown in Table 75 (See Appendix B). These include chi-square value, minimum discrepancy divided by degrees of freedom (CMIN/DF), Root

mean square error of approximation (RAMSEA), Normed fit index (NFI), Incremental fit index (IFI), p-value for test of close fit (PCLOSE), comparative fit index (CFI), and Parsimony comparative fit index (PCFI).

CMIN is a Chi-square statistic that compares the tested model and Independent model to the saturated model. CMIN/DF is a relative Chi-square measuring how much the fit of data to model has been reduced by dropping one or more paths. Smaller $\chi 2$ values indicate better fitting model, an insignificant $\chi 2$ ($p>.05$, $p>.01$) is desirable. CFI and GFI are independent of model complexity and sample size. Multicollinearity was checked by checking the correlation matrix of the variables that were used in SEM. When multicollinearity is between 0.6 and 0.8, then Type II error rates (of accepting a wrong null hypothesis) can be substantial (greater than 50%) – leading to a wrong conclusion (Grewal & Baumqartner, 2004).

The various model fit criteria are summarised in Table 75 (Appendix B). The diagnostic test results of the structural equation model obtained for the proposed conceptual model revealed a good model fit, and all the other measures of model fit were acceptable. According to the Chi-Square goodness of fit tests the null hypothesis that the predicted model and observed data are equal. Therefore, chi2(2) = 0.01, Prob > chi2 = 0.9931 means that the model fit was good. RAMSEA = 0.000<.08, CFI = 1.000 and Pclose = 0.997, which imply that the model fit was acceptable.

The SEM is shown in Figure 5.36 and regression weights are shown in Table 5.15. In SMEs, factor 1 refers to gender inequalities; factor 2 relates to government and skills constraints; X92 equals discussing business via cellphone, and X94 matches with ordering stock over cellphone (See Table 5.15).

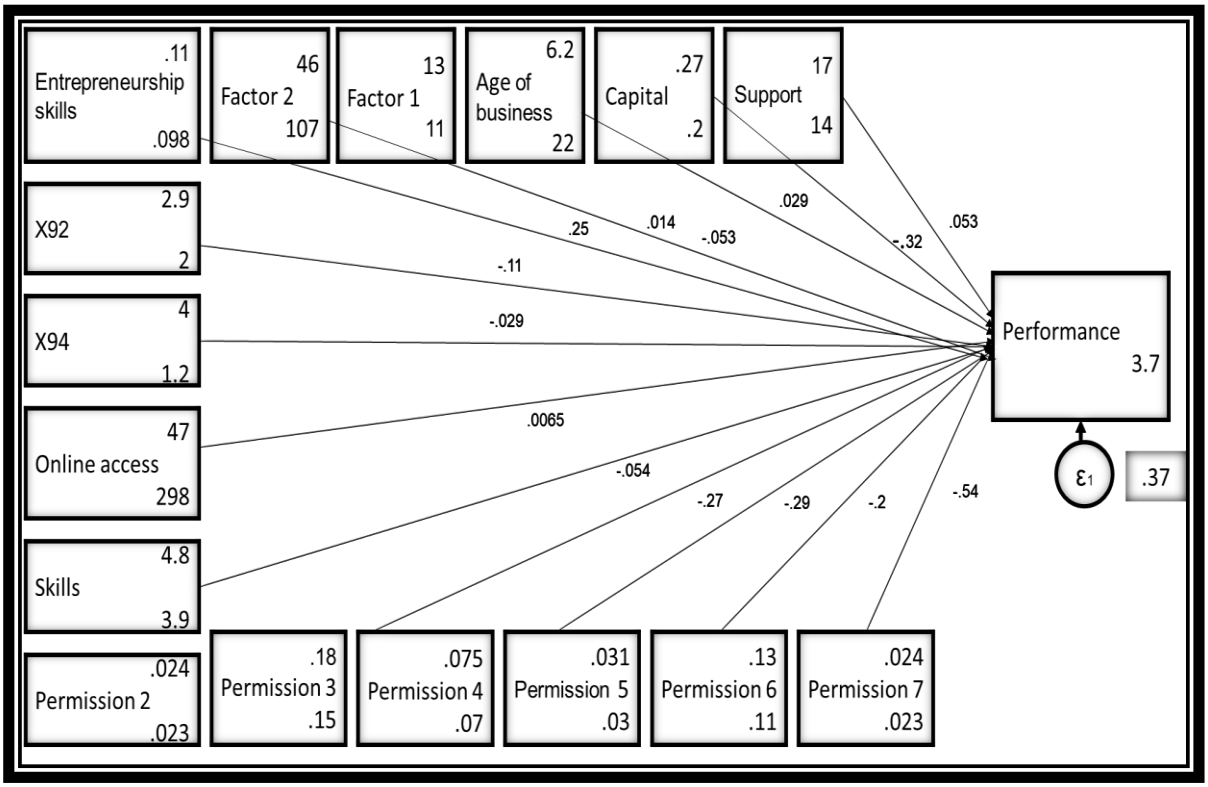

Figure 5.36: Structural equation mode (Researcher, 2020)

Table 5.15: Regression weights

Structural equation model Estimation method = ml	Number of obs = 292 Log likelihood = -6344.7472			
Coef.	**Estimate**	**-Std. Err.**	**Z**	**P>|z|**
Entrepreneurship skills	.254	.119	2.13	0.033
Factor1 (Gender Inequalities**)**	.053	.012	-4.08	0.000
Factor 2 (Government & Skills Constraints)	.014	.005	2.79	0.005
Age of Business	.029	.008	3.48	0.001
Capital	-.317	.087	-3.64	0.000
X92 (discuss business on a cellphone)	-.113	.032	-3.55	0.000
X94 (order stock on cellphone)	-.029	.036	-0.81	0.420
Online Access	.007	.003	2.44	0.015
Skills	-.054	.026	-2.11	0.035
Permission 4	-.269	.141	-1.91	0.057
Permission 5	-.291	.212	-1.37	0.170
Permission 6	-.200	.117	1.71	0.086
Permission 7	-.542	.239	-2.27	0.023
Support	.053	.012	4.32	0.000
Constant	3.725	.337	11.04	0.000

LR test of model vs. saturated: chi2(2) = 0.01, Prob > chi2 = 0.9931

From Table 5.15 it can be deduced that, the variable Entrepreneurial performance is influenced by entrepreneurship skills, gender inequalities, government and skills constraints, age business, capital, x92 (I discuss business on a cellphone with my networks instead to traveling to meet them), permission 4 (It was my husband's proposition), Permission 5 (No husband, I made the decision myself (widow)), Permission 6 (Yes, I asked for permission from my family and they were supportive (single)) and Permission 7 (No, I did not ask for permission from my family (single)). See Figure 5.37.

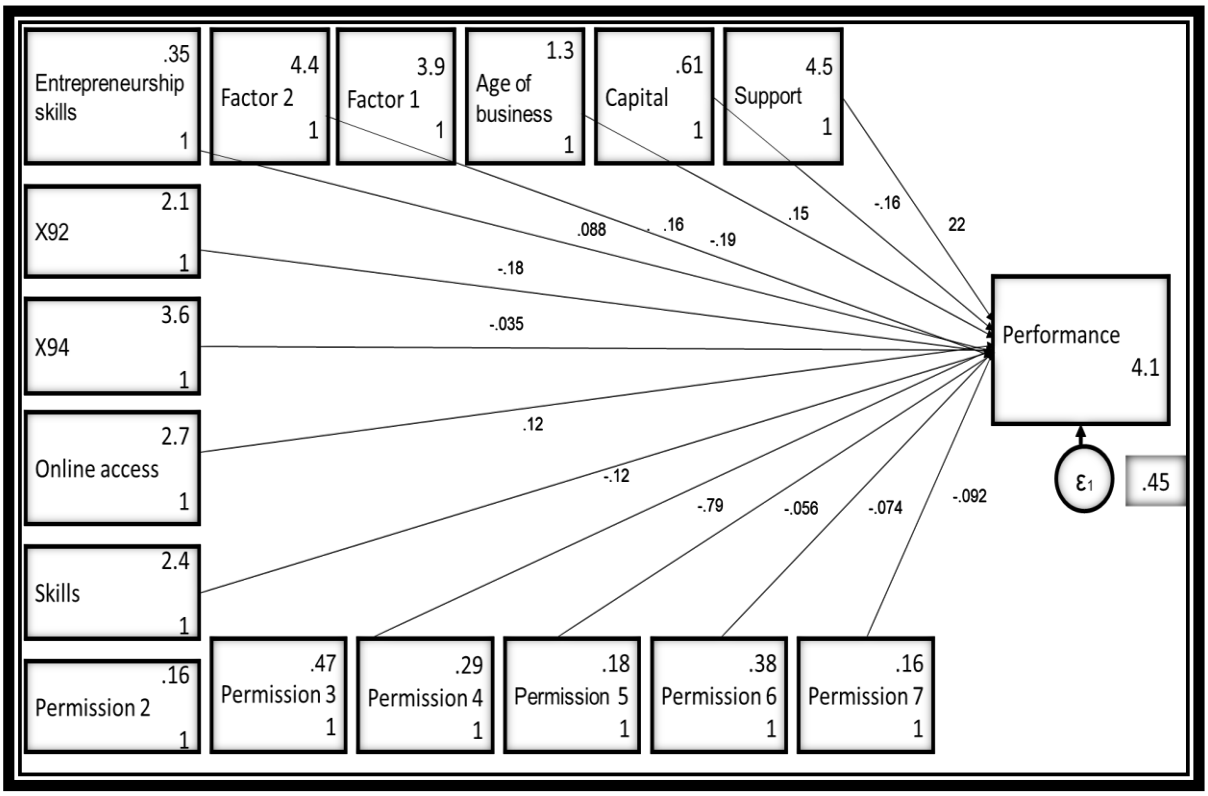

Figure 5.37: SEM with standardised coefficients (Researcher: 2020)

Entrepreneurial skills (z=2.13, p=0.03<.05) is statistically significant at the 5% level of significance, implying that the first null hypothesis should be rejected and the alternative hypothesis that business knowledge or skills affect EP positively is accepted. This means that entrepreneurial skills are an important factor of EP of women-owned small and medium enterprises in Kigali, Rwanda.

Age of business (z= 3.48, p=.001<.05) and capital (z=-3.64, p=.000<.05) are statistically significant both at the 1% and 5% level of significance; this implies that the second hypothesis should be rejected and the alternative hypothesis that constraints that face women-owned small and medium enterprises affect EP is accepted. This

implies that Age of business or the time a business has been in operation and capital affect EP positively. It should be noted that the coefficient of capital is negative because the computer software, Stata, which was used to analyse the data calculates the coefficient of the dummy variable when its value is equal to 1. The dummy variable, “capital” equalled to “1”, when it was less than RwF 500 000 and the capital dummy equalled ”0”, when capital was RwF 500 000 - 15 500 000 or more. It was found that age of business and capital affected the women-owned small and medium enterprises positively such that the more time the business spends in operation and the more capital the owner uses to start a business the better the business perfoms.

Seven dummy variables were formed for the question, “Did you ask for permission from your husband or family to start a business?” The first dummy variable, that is, Permission 1, “Yes, I did and my husband was supportive” was the reference dummy or category. Permission 4 (It was my husband’s proposition) ($z=-1.91$, $p=0.057<.1$) and Permission 6 (Yes, I asked for permission from my family and they were supportive (single) ($z=-1.71$, $p=0.086<.1$) were statistically significant at the 10% level of significance, and Permission 7 (No, I did not ask for permission from my family (single)) ($z=-2.27$, $p=0.023<.05$) was statistically significant at the 5% level.

Permission 2 and Permission 3 were not included in the regresssion model to avoid the collinearity problem. These results imply that the first null hypothesis should be rejected and the alternative hypothesis that permission from husband or family affects the women-owned small and medium enterprises in Kigali, Rwanda accepted. The results indicated that asking for permission from the husband helps the business to grow, possibly because of the support that comes from the husband, financially or otherwise.

Gender inequalities ($z=-4.08$, $p=.000<.05$) and government and skills constraints ($z=2.79$, $p=.005<.05$) are statistically significant both at the 1% and 5% levels of significance; this implies that the fourth hypothesis should be rejected and the alternative hypothesis, constraints that face women-owned small and medium enterprises affect EP is accepted. It is surprising to note that though gender inequalities have been found to affect EP negatively, government and skills constraints are found to affect EP positively, as their coefficient is positive. The reason for this was not investigated in this study, which calls for another study. The coefficient of gender

inequalities has the right theorised sign of negative as expected. This implies that gender inequalities are hindering women-owned small and medium enterprises of Kigali in Rwanda. The scores of the online access were combined by adding all of them to form a variable, referred to “online access” after finding out that the questions or items were categorised into one factor, using factor analysis. It was not necessary to use mean values because missing values were negligible. Online access ($z=2.44$, $p=0.015<.05$) is statistically significant at the 5% level of significance, implying that online access increases EP.

For skills, $z= -2.11$, and $p = .035<.05$. This implies that skills affects EP. However, it is surprising that the sign of the coefficient of skills is negative, which would imply that skills decresaes EP, which is theoretically not correct, and was not expected. This was not investigated and hence, the need for a further study. The results implied that fifth null hypothesis should be rejected and the alternative hypothesis that ICT affects EP was accepted. This meant that the Use of ICT is an important factor of EP of the women-owned small and medium enterprises of Kigali, Rwanda.

Role of leadership and stakeholders or support ($z= 4.32$, $p=.000<.05$) is statistically significant at both the 1% and the 5% levels of significance, implying that the first null hypothesis should be rejected and the alternative hypothesis that is support from leadership and stakeholders affect EP positively is accepted. This means that the support obtained from leadership and stakeholders is an important factor of EP for women-owned small and medium enterprises in Kigali. This support is necessary for the enterprises for their development.

According to Figure 5.37, the most important factors of entrepreneurial development are: support from leadership and stakeholders (B=.22), capital B=-.16), age of business (B=.15) and online access (B=.12). Therefore, the purpose of this study was to identify the importance of ICT in women-owned businesses in Kigali. The outcome was an integrated proposed model that can be applied to improve women businesses performance, competitiveness, effectiveness and efficiency in Rwanda and other developing countries. The model indicates that different factors such as leadership, stakeholders, capital, age of business, skills, online access, among others influence the performance of the business. Women-owned SMEs in Kigali need a good relationship with the government and different stakeholders, for instance, suppliers,

consumers, financial institutions, RCWE, PSFamong many others to ensure the performance and success of their SMEs. It is suggested that investing a significant capital position in the business, increases market share and ultimately promotes the performance, growth and sustainability of SMEs. ICT adoption into the business has shown a positive effect on business performance and innovation. However, women-owned SMEs in Kigali may improve their ICT skills to face the threats of business environment, perhaps, challenge the fourth industrial revolution, which promotes the user of ICT and artificial intelligence.

As discussed earlier in Chapter Three, the researcher proposed TOE adoption of ICT among women-owned SMEs in Kigali. From the findings, the model was developed. The question that arises: “does the model match with the criteria of Technology-Organisation-Environment Theory?” The answer is “Yes” because the model contains the elements of TOE theory such as the Internet and cellphone technology that women entrepreneurs use in their business and they show the need to improve their cognitive ability in ICT so that they can be more competitive (entrepreneurial performance). However, they operate in an environment which requires them to satisfy consumer needs, comply with e-government services, and most importantly compete successfully with rivals. Therefore, the model relates to TOE theory adoption.

This model supports Technology-Organisation-Environment Theory (TOE) adoption of ICT into a SME. The TOE views business environment as an area surrounded by multiple stakeholders such as industry, leaders, rivals, manufacturers, consumers, the government, the society, among others. They affect how SMEs interpret the need for innovation and the adoption of ICT, ability to procure capital to implement ICT innovation, and its ability to ultimately execute it to position the business, improve the performance and market share to ensure the sustainability of SMEs. TOE has been identified as complex for SMEs, however, based on the variables in the model which can be applied to increase business performance, TOE is an appropriate ICT adoption to challenge the macro-environment, overcome constraints women-owned SMES in Kigali encounter to ensure business growth and sustainability (Tornatzky & Fleisher, 1990; Baker, 2012; Mohanty, 2019; Abed, 2020).

5.6. Summary of this chapter

Data was collected from 409 women-owned small and medium enterprises on various aspects concerning ICT in women-owned businesses in Kigali, Rwanda. Descriptive and inferential data analysis were done. Descriptive analysis was used to summarise the data and profile the enterprises and the inferential analysis was used to test the study hypothesis.

The following hypothesis were tested:

H_1: There is a positive relationship between motivation and new women enterprise creation in Kigali, Rwanda. It was found that there is a positive relationship between motivation and new women enterprise creation in Kigali, Rwanda. It was accepted.

H_2: There is a negative relationship between the constraints faced by women-owned businesses in Kigali, Rwanda and the management of small-sized enterprises. This hypothesis was not tested for lack of data.

H_3: There is a negative relationship between constraints faced by women-owned businesses in Kigali, Rwanda and the use of Internet in women businesses to find a solution of those constraints. It was found that there is a negative relationship between the constraints faced by women-owned businesses in Kigali, Rwanda and the use of Internet into women businesses in Kigali, Rwanda to find a solution of those constraints was accepted.

H_4: There is a positive relationship between stakeholders' ICT initiatives and effective integration and use of ICT in women enterprises in Kigali, Rwanda in order to ensure women businesses competitiveness. It was found that there is a positive relationship between stakeholders' ICT initiatives and effective integration and use of ICT in women enterprises in Kigali, Rwanda in order to ensure women businesses competitiveness was accepted.

In conclusion, it has been found that entrepreneurial skills, age of business, capital, permission from husband or family, use of ICT and support from leadership and stakeholders for the enterprises are important factors for entrepreneurial performance and hence, entrepreneurial development. The industry in which a business is done also matters. Constraints such as gender inequalities, government, financial and skills constraints should be avoided. The last chapter provides the conclusions and recommendations.

CHAPTER SIX
CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

The previous chapter focussed on data analysis, presentation of results and discussion of findings. This chapter addresses the conclusion and recommendations. Jensen and Laurie (2016) stated that the conclusions and recommendations chapter ends the research journey. It summarises each chapter and provides a general conclusion. In line with Saunders et al. (2009) recommendations addressed in this study were generated from the findings, they needed more attention to ensure the sustainability of women-owned SMEs in Kigali. Perhaps, they could also be applied to other developing economies.

The researcher proposes the best practice to mitigate uncertainly or a solution that can improve the current situation to sustainability. Therefore, the recommendations to improve the adoption and integration of ICT among women's SMEs in Kigali, Rwanda, and the suggestions to improve their businesses' growth to sustainability were addressed. In addition, future studies are recommended. Contribution of the study to body of knowledge are presented. This chapter begins by summarising the preceding chapters, followed with revisiting the objectives, addressing recommendations, suggesting future studies, contributing to the study to body of knowledge, and finally the conclusions.

6.2 Summary of preceding chapters

6.2.1 Chapter One

Chapter One introduced the research. It provided a snapshot of the background of the study. It addressed the problem statement, set objectives to attain, and formulated the research questions to be answered to reach the objectives. The research design and methodology to conduct the research study were addressed. The validity and reliability were highlighted. The ethical considerations that guided the researcher was addressed

and limitations of the study were acknowledged. The significance of the research and expected outcomes were indicated. Finally, an outline of the research was presented.

6.2.2 Chapter Two

Chapter Two presented the importance of the literature review as a primary source of information on the importance of ICT in women-owned businesses in Kigali, Rwanda. The source of the literature review and methods used to organise the literature review were highlighted. Entrepreneurship and its role in creating jobs, generating revenues, and stimulating socio-economic development were addressed. Woman entrepreneur is defined, and the impact of Rwandan women SMEs' in building the country and socio-economic growth were emphasised. The business lifecycle as a measure for evaluation of business performance was discussed.

It reviews the current literature broadly but focusses on Rwanda. Therefore, the factors influencing women to become engaged in entrepreneurial activities known as push and pull motivation factors were discussed. The gender inequality, finance, government, skills, and own constraints experienced by women entrepreneurs in doing SMEs in Kigali were debated. The role of ICT could intervene to find the solution to constraints facing women entrepreneurs in running SMEs in Kigali was emphasised. Moreover, the administration and stakeholder's ICT support to women-owned SMEs in Kigali such as ICT policy, ICT infrastructure, ICT training, ICT support projects, and ICT women role model motivation highlighted. Also, hypothesis emanated from the literature reviewed were presented.

6.2.3 Chapter Three

Chapter Three discussed the different ICT adoption theories and models. These included Technology Acceptance Model (TAM), Technology-Organization-Environment (TOE), Diffusion of innovation (DOI), Actor-Network Theory (ANT), and the Unified Theory of Acceptance and Use of Technology (UTAUT). Technology-Organization-Environment was widely debated as it provided the framework for the study.

6.2.4 Chapter Four

Chapter Four described the research design and methodology; the positivist philosophy that underpins the study is stated. The quantitative methodology guided by the research is discussed. Kigali as a research area and reason of choice was justified. The women-owned SMEs in the Kigali target population and how the number for the sample population was obtained was explained. The computer-assisted personal interviewing used to collect data is described. The pilot test, field data collection, and how ethical considerations were applied during data gathering were clarified. Validity and reliability were discussed. The SPSS version 26 and Stata version 16 were used to analyse and test different variables, including descriptive statistics; Pearson's correlation coefficient; inferential analysis; reliability tests; test for normality; Bartlett's test for sphericity; Kaiser-Meyer-Olkin test, and structural equation modelling.

6.2.5 Chapter Five

Chapter Five provided details about quantitative data analysis in which the findings were presented and discussed systematically with the research questions and objectives. SPSS and Stata were used to process data. Data was collected from 409 women-owned small and medium enterprises on various aspects concerning ICT in women-owned businesses in Kigali, Rwanda. Descriptive and inferential data analysis were done. Descriptive analysis was used to summarise the data and profile the enterprises. Inferential analysis was used to test the study hypothesis.

It has been found that entrepreneurial skills, age of business, capital, permission from husband or family, use of ICT, and support from leadership and stakeholders for the enterprises are essential factors of entrepreneurial performance and hence, entrepreneurial development, the industry in which a business operated also contributed to the business performance for instance, SMEs in service industries. Constraints such as gender inequality, government, financial, and skills constraints should be avoided.

During a discussion of findings, the literature review was used as support and to compare the existing knowledge with the finding of this study on the importance of ICT in women-owned SMEs. The overall structure of the chapter takes the form of seven

sections. These including socio-demographic information, business knowledge or skills and business profile. Factors influencing women to become engaged in entrepreneurial activities in Kigali; constraints experienced by women entrepreneurs in Kigali; ICT intervention to find the solution to constraints encountered by women entrepreneurs in Kigali, and Rwanda administration and stakeholders, ICT policies support the successful integration and use of ICT in women enterprises in Kigali.

6.2.6 Chapter Six

Chapter Six concludes the research and provides the recommendations. The research objectives and questions are revisited and compared with the findings to conclude whether the objectives were achieved. Recommendations to improve best practice among women-owned SMEs are suggested. Future study is recommended. Finally, the conclusion is written. The next section restates the ideals with the objectives as a reminder of what this study was about.

6.3 Objectives and findings

This study aimed to identify the importance of ICT in women-owned businesses in Kigali Rwanda. The five objectives were formulated to achieve the purpose of the aim. The first objective was to identify the factors influencing women in Kigali, Rwanda to to become engaged in entrepreneurial activities. The second was to identify the constraints experience by women entrepreneurs in running small and medium businesses in Kigali, Rwanda. The third explores how information and communication technology could intervene to find a solution to constraints facing women entrepreneurs in doing small and medium businesses in Kigali, Rwanda. The fourth objective investigated whether the Rwanda administration and stakeholders' information and communication technology policies support the successful integration and use of ICT in women enterprises in Kigali, Rwanda. Finally, a framework was developed that could be used to improve the efficiency, effectiveness, and competitiveness of women enterprises in Kigali. The findings of this study determined whether the aim and objectives were achieved or not. Therefore, each objective is discussed below with its main findings.

6.3.1 Objective 1

The first objective was to identify the factors influencing women in Kigali, Rwanda to become engaged in entrepreneurial activities. To achieve the objective, the following research question was formulated “What are the factors influencing women in Kigali, Rwanda to become engaged in entrepreneurial activities?” The finding indicated that push factors related to necessity entrepreneurs dominated over pull factors linked to opportunity entrepreneurs. Unemployment was identified as the primary reason women entrepreneurs started SMEs in Kigali. They were necessity entrepreneurs, pushed to entrepreneurship because they did not have another source of income to meet their needs. They experienced job dissatisfactions, resigned and launched their own SMEs.

In contrast, women who needed time to care for their family while generating income and self-actualization, started SMEs with sustainability growth intention; they were dominated among the opportunity entrepreneurs. Comparing pull and push factors, motivated women, to start SMEs in Kigali, push factors were majority around two-thirds of respondents opposite to approximately one quarter pull factors. Therefore, the factors that influenced women in Kigali, Rwanda to become engaged in entrepreneurial activities were identified. The next section discusses objective two.

6.3.2 Objective 2

The second objective was to identify the constraints experienced by women engaged in entrepreneurial activities in Kigali, Rwanda. The research question “What are the constraints experienced by women entrepreneurs in running small and medium businesses in Kigali, Rwanda”, was formulated. The constraints were categorised into five groups, respectively - gender inequality, financial, government, skills, and own fear. The findings suggested that owner fear, skill, and government constraints challenged women entrepreneurs in running SMEs in Kigali. Unpredictably, gender inequality and finances were not a threat to these women-owned SMEs.

Taking into account of each of the variables; HIV/AIDS had the most alarming constraints. This was followed with lack of entrepreneurship skills, lack of market opportunities, access to government service, high taxes, lack of education and training,

lack of business experience, inability to obtain public tenders, lack of information technology skills, fear of failure, bribery of government officials, business registration, lack of management skills, lack of incubator center, high communication cost, and high transport cost constraint. Thus, the constraints experienced by women engaged in entrepreneurial activities in small and medium businesses in Kigali, Rwanda were identified and objectives attained. The following section discusses objective three.

6.3.3 Objective 3

The third objective was to explore how ICT could intervene to find the solution to constraints facing women entrepreneurs in doing small and medium businesses in Kigali, Rwanda. To attain the objective, the following question was formulated “How could information and communication technology intervene to find solutions to constraints faced by women-owned SMEs engaged in entrepreneurial activities in Kigali, Rwanda.”

Many ways of how women-owned SMEs in Kigali could leverage the Internet and cellphone to mitigate, find a solution, or be part of the solution to constraints they faced were explored and described. Best practices and lessons learned were highlighted. The findings indicated that the cellphone was most useful to order inventory and discuss business with networks instead of traveling to meet the physical person. They leveraged the Internet to access government service and business registration. This is not surprising because in Rwanda, business registration, services related business and payments are conducted online.

Except for business registration and online access to government services, many women-owned SMEs in Kigali did not take advantage of the Internet to search for information that could help them to overcome the constraints they experienced. But, the effort is needed to access more on cloud computing information. The third objective is achieved. The next section addresses objective four.

6.3.4 Objective 4

The fourth objective was to investigate whether the Rwanda's administration and stakeholders' ICT policies supported the successful integration and use of ICT in women enterprises in Kigali, Rwanda. To attain the objective, the following question was formulated "Does Rwanda's administration and stakeholders' information and communication technology policies support the successful integration and use of information and communication technology in women-owned small and medium enterprises in Kigali, Rwanda"?

The findings reveal that the government and stakeholders encourage women-owned businesses in Kigali to use ICT in their daily business activities. They benefited from ICT training from stakeholders - they could register their businesses online, comply with government related business and service online, and they were empowered on how to leverage ICT to improve their efficiency and effectiveness, ultimately increase business performance, competitiveness, and sustainability and growth. However, there is no ICT privilege that they received from the government as compared to their male counterparts. Therefore, objective four is achieved. The last objective is now presented.

6.3.5 Objective 5

The last objective was to develop a model that could be used to improve the efficiency, effectiveness, and competitiveness of women enterprises. The model is developed from the findings. The model was tested and approved. The model depicts that the performance and sustainability growth of women's SMEs in Kigali relied on various factors including support from leadership and stakeholders, capital, age of business, and online access. Thus, the fifth objective is attained. The next section addresses recommendations for this study.

6.4 Recommendations

The recommendations were generated from the findings and supported by the literature review of this study. It is suggested that these recommendations can improve the growth and sustainability of women-owned enterprises. The recommendations are divided into two parts, including recommendations for women-owned SMEs in Kigali and chamber of women entrepreneurs and stakeholders.

6.4.1 Recommendations for women-owned small and medium businesses in Kigali

The findings indicated that around two-thirds of respondents where necessity entrepreneurs, and they started a business due to a lack of another source of income. Even though there are a number of graduates who enter the labour market every year, the rate of unemployment continues to increase. The private and public sectors could not satisfy the labour market in employment. Women should view entrepreneurship as a career path to launch opportunity enterprises instead of seeking work in the low paying labour market.

HIV/AIDS was identified as the major challenge to women-owned SMEs in Kigali. Literature indicated that those who live with HIV/AIDS were victims of stigma and discrimination. It is suggested that those who live with HIV/AIDS use the Internet to search information on how to manage stigma and discrimination. For instance, Rwanda Biomedical Center (RBC) and the United Nations Programme on HIV/AIDS (UNAIDS) provide a full package on HIV/AIDS management.

The findings indicated that entrepreneurship skills were a second constraint experienced by women-owned SMEs in Kigali. They should leverage the Internet to attend free entrepreneurship training and education provided by reputable institutions, for instance, World Bank's Open Learning Campus and Courser and Goldman Sachs. They will benefit from these courses and strengthen their entrepreneurship skills and gain international best practice, obtain a certificate, become a member of Goldman Sachs 10 000 Women, and most importantly, access networking. Through acquiring entrepreneurship skills, they could overcome the lack of market opportunity and lack of management skills. The training has shown the power of applying skills to manage

enterprises effectively, to increase market share and find a new market. Embracing ICT became a competitive advantage tool that provides business with many opportunities in the business world, for instance, in the supply chain and penetrating the international market.

Women-owned SMEs in Kigali encountered a lack of market opportunities. However, the effective integration of ICT position SMEs. This was successful in 21 member states of Asia-Pacific Economic Cooperation (APEC). They improved their business performance and extended the local market and penetrated the international market due to ICT adoption. Women-owned SMEs in Kigali could learn best practices from women-owned SMEs in APEC, who successfully leveraged ICT by effective integration of ICT into their SMEs.

They revealed that keeping ICT in business; exploiting cloud computing, an Internet search engine of things, and even augmented reality will keep SMEs competitive. At the same time is it important to engage in advertising products and services on social media, using the Internet to post products or services to reach a large market as possible. These should be strengthened with innovation and offering high-quality products and services that are value for money. These were strategies used by women entrepreneurs in APEC in order to succeed, position their SMEs, extend the market, and achieve a competitive advantage (APEC, 2018).

Access to government service was reported as a constraint experienced by women-owned SMEs in Kigali. Rwanda's administration adopted ICT to access government services. Women-owned SMEs in Kigali should use the Internet to access government services.

Findings from a longitudinal study conducted for 12 years in the USA, revealed that more than 93% of SMEs in the USA paid more taxes than they should. However, online software like TaxSlayer, TurboTax, and H&R Block calculate taxes free of error and do not need an expert, they are easy to use (Daisyme, 2018). Women-owned SMEs in Kigali should use tax software to calculate their taxes to avoid mistakes.

Lack of ICT skills challenges women-owned SMEs in Kigali. Women-owned SMEs could search for suitable training online to improve their skills in ICT to enable them to run a modern and competitive business.

Fear of failure harms women-owned SMEs in Kigali. They should leverage the Internet to help them to eliminate the fear of failure. Some dedicated successful women entrepreneurs provide online mentoring and coaching to prospective women entrepreneurs, start-ups, and those on growing phase. These opportunities should be taken up by women-owned businesses. There are also groups that share business skills and experience and joining these groups can offer women strength to decrease the stress of failure and encourage them to run successful, profitable and sustainable ventures (Harris, 2018).

6.4.2 Recommendations for chamber of women entrepreneurs and stakeholders

HIV/AIDS was identified as the most severe constraint experienced by women-owned SMEs. Those who live with HIV/AIDS were discriminated. They could not obtain credit from suppliers and customers avoiding supporting them. The Chamber of Women Entrepreneurs in collaboration with the Ministry of Health and other stakeholders should intensify the health education to eradicate the stigmatisation, discrimination and distress faced by HIV positive women that own SMEs in Kigali.

Lack of entrepreneurship skills challenges women-owned SMEs in Kigali. Trainer organisers should scan the business environment to empower women-owned SMEs in Kigali with relevant skills to position their businesses, improve performance, competitiveness, and improve market share. It is suggested that ongoing entrepreneurship training among women-owned SMEs in Kigali, could help them to extend product range; launch innovation to polish their businesses, and expand business outlets.

Lack of information technology isolates entrepreneurs. Thus, without embracing ICT, there is no predictable bright future for their business. The Chamber of Women Entrepreneurs and stakeholders should train women-owned SMEs in end-user-

computing and some data analytic software to empower them with skills to enable them to improve their business performance, growth and revenues.

The findings revealed that 95.6% of women-owned SMEs in Kigali were not members of the Chamber of Women Entrepreneurs. This should be investigated to discover why many women-owned SMEs in Kigali did not join the Chamber of Women Entrepreneurs.

6.4.3 Recommendation for the Government of Rwanda

Entrepreneurship skills have qualified as a source of business performance and sustainability and growth (Kelley et al., 2017). However, women-owned SMEs in Kigali face a lack of entrepreneurship skills despite the stakeholder effort to train them. At the same time, entrepreneurship is taught in secondary school and tertiary education. The findings indicated that the majority of women-owned SMEs in Kigali completed secondary school. Therefore, the government should update the entrepreneurship programme in secondary and tertiary education with relevant skills that enable women to be creative, innovative, find new business opportunities, improve their business's performance, and market share.

Access to government services was reported as challenging women-owned SMEs in Kigali. The government should create flexible policies that enable clients to obtain excellent and timely services that will allow them to grow their businesses.

Women-owned SMEs in Kigali claimed that high taxes challenged them. Women struggle to set up a business, and it is a challenge for them to pay taxes immediately after opening business doors. It is suggested that the government should provide a tax exemption for a particular period as done in European Union countries to support entrepreneurs to set up a business and to have cash flow. This will encourage entrepreneurs to launch new businesses, create new jobs, and decrease the failure rate.

It has been identified as difficult for women-owned SMEs in Kigali to obtain public tenders. The Rwandan administration appointed a majority of females in parliament and a half in the cabinet. The Rwandan administration appointed a majority of females

in parliament and a half in the cabinet. The Rwandan constitution, article 10th ensures appointing women in at least 30% in senior positions (Rwanda, 2015). However, women are still underrepresented in entrepreneurship. The Rwanda government should follow South Africa administration best practice who awarded 40% of a public tender to women entrepreneurs to improve their business activities, embracing medium and large enterprises (Independent Online, 2020).

The respondents reported that there is bribery among government officials; the corrupted should be reported, prosecuted, and punished. The law should be reinforced to prosecute and punish the corrupt officials.

6.5 Limitations of the study

The research had limitations. Due to the limited budget, time, and transport barriers, the study focused only on the City of Kigali and not the entire country. The sample population was limited to women-owned formal SMEs in Kigali, 18 years and older. Both large and informal enterprises and men's enterprises were excluded. The financial restriction could not allow the researcher to travel from Cape Town, South Africa, to Kigali, Rwanda. For this reason, he hired a research assistant to collect data. Notwithstanding these limitations, the study suggests that integration and use of ICT in women-owned SMEs in Kigali is vital to survive the pressure of the business environment which promotes the technology. However, women-owned businesses need government and stakeholder support. Therefore, these limitations propose future studies.

6.6 Suggestion for future studies

Despite women-owned SMEs incredible efforts to contribute to mainstream entrepreneurship and adoption of ICT into their enterprises, there is still a long way for them to achieve sustainability of their businesses. It is vital to continue research on women entrepreneurship and how to leverage ICT to strengthen their business, improve their performance, competitiveness, and sustainability and growth.

This study was limited to women-owned SMEs in Kigali. A future study could look at how the adoption of ICT into women's SMEs in a rural area could add value to their crops and improve their productivity. Majority of women-owned SMEs in rural areas

deal with farming and they still practice traditional farming, which is characterised by the hard work and less production.

This study was also limited to women-owned SMEs in Kigali. A future study should look at how the adoption of ICT among men-owned SMEs in Kigali could help to overcome the constraints they may face in doing business in Kigali. The results could be compared with those of this study to identify the importance of integrating ICT into SMEs.

Since the study was limited to women-owned SMEs in Kigali, a future study could consider looking at the importance of the adoption of ICT in women-owned large businesses in Kigali.

The findings indicated that women in Kigali engaged in entrepreneurial activities due to a lack of another source of income. A future study could explore the reasons why women do not consider entrepreneurship as a path career.

The findings showed that women-owned SMEs in Kigali were less active to leverage the Internet. A future study should look at the barriers that hamper the adoption and use of ICT among SMEs.

Since this study is limited to quantitative design, it lacks a deep understanding of the importance of ICT in women-owned SMEs in Kigali. A future study should look at the same topic using mixed methods to have a broad knowledge of the phenomenon.

The findings demonstrated that fear of failure challenged women-owned SMEs in Kigali. A future study could look at the impact of fear of failure on mental health.

Hypothesis two (H_2): There is a negative relationship between the constraints faced by women-owned businesses in Kigali, Rwanda and the management of small-sized enterprises was not tested for lack of data. The future study will look at this hypothesis and test it.

Regression weights of the model were surprising to note that although gender inequalities have been found to affect EP negatively, government and skills constraints

are found to affect EP positively, as their coefficient is positive. The reason for this was not investigated in this study, which calls for another study.

Regression weights of model indicated that for skills, z= -2.11, and p = .035<.05. This implies that skills affect EP. However, it is surprising that the sign of the coefficient of skills is negative, which would imply that skills decrease EP, which is theoretically not correct, and was not expected. This was not investigated and hence, a further study is needed.

The following section presents the contribution of this study on the body of knowledge.

6.7 Contribution of the study to body of knowledge

- The findings of this study identified the factors that influenced women to become involved in entrepreneurial activities in Kigali. It is necessary to add these findings to the body of knowledge.
- Gender inequality was not a threat for women-owned SMEs in Kigali. Other researchers, policymakers, and organisations could leverage from Rwanda's best practice to promote gender parity in entrepreneurship.
- Access to finance was not a constraint to women-owned SMEs in Kigali compared to many countries. Researchers and policymakers could learn from Rwanda's best practice on how to overcome inadequate access to finance among women entrepreneurs.
- This study identified the constraints encountered by women-owned SMEs in Kigali, Rwanda that could add to the body of knowledge. Perhaps, the findings could be compared with the existing constraints in various economies.
- The model was produced from the findings. Adding it to the body of knowledge could be used by entrepreneurs to improve their business performance; and it could serve as a reference and didactic material in education and training.
- The study indicates how adoption of ICT among women-owned SMEs could overcome the constraints they face, ultimately position business.

The last section of the research process concludes the thesis.

6.8 Conclusion

The research aimed to identify the importance of ICT in women-owned SMEs in Kigali. Since women-owned SMEs in Kigali faced constraints in running businesses, it suggested that adoption of ICT into their SMEs would mitigate, find a solution, or part of the solution to the constraints. However, to realise this, women-owned SMEs in Kigali should embrace ICT and receive support from government, Chamber of Women Entrepreneurs and stakeholders to integrate and use ICT in their SMEs.

To achieve the main objective “to identify the importance of ICT in women-owned businesses in Kigali”, a quantitative research design was used to collect cross-sectional data using computer-assisted personal interviewing for 409 women-owned SMEs in Kigali. The sample population was selected purposively, and data was analysed using SPSS 26 version and Stata 16 version.

This study has identified that unemployment has been described as the key reason why women entrepreneurs have set up necessity SMEs in Kigali. In contrast, women who wanted time to take care of their families while producing revenue, were dominated in the group of opportunities entrepreneurs. Push factors relating to the necessity entrepreneurs, overshadowed the pull factors linked to opportunity entrepreneurs. These results reflect those of Fatoki (2014) who also found that unemployment was a significant factor that pushed women under 35 years to launch SMEs in Polokwane and Mankweng in the Limpopo province of South Africa.

Despite different motives to drive women into entrepreneurship in Kigali, they faced constraints. The most significant constraint was HIV/AIDS. This was accompanied by a shortage of entrepreneurial skills, lack of market opportunities, access to government service, high taxes, lack of education and training, lack of business experience, inability to obtain public tenders, lack of information technology skills (e.g., Internet), fear of failure, bribery of government officials, business registration, lack of management skills, lack of incubator centre, high communication cost, and high transport cost constraint.

Remarkably, gender inequality and access to finance were not constraints confronting women-owned SMEs in Kigali. These findings are contrary to those by the Global

Entrepreneurship Monitor 2016/2017 Report on Women's Entrepreneurship who found that access to finance and gender inequality were among the challenges faced women-owned SMEs in over hundred countries members of Global Entrepreneur Monitor (Kelley et al., 2017).

It is suggested that the adoption of the Internet and cellphone would help them to overcome the constraints they encountered. Unfortunately, a considerable number of women-owned SMEs in Kigali have not leveraged the Internet to search for information that could help them resolve the constraints they have experienced. This could be attributed to a lack of ICT skills. However, the mobile phone was most effective in buying stock and negotiating business with networks rather than moving physically to reach them. These results share similarities with Adewoye et al. (2013) findings which showed that women entrepreneurs in South Western Nigeria struggled to exploit cloud computing due to lack of ICT literacy contrary to the cellphone which was regularly used in business activities.

Notwithstanding an ineffective user of Internet among women-owned SMEs, the government, Chamber of Women Entrepreneurs, and stakeholders encourage them to integrate and use ICT tools in their day-to-day business activities. They continue to provide them with ICT training enabling them to leverage the Internet and cellphone to improve their business performance, competitiveness, and comply with the government's online services. Consistent with the literature, this research found that stakeholders work together to encourage, train, and improve ICT adoption and use among women-owned SMEs in Kigali (Bishumba, 2017; Taarifa, 2019).

Furthermore, the hypothesis was tested and it was found that there is a positive relationship between motivation and new women enterprise creation in Kigali, Rwanda. The hypothesis that there is a negative relationship between the constraints faced by women-owned businesses in Kigali, Rwanda, and the use of the Internet into women businesses in Kigali, Rwanda to find a solution to those constraints was accepted. The hypothesis that there is a positive relationship between stakeholders' ICT initiatives and effective integration and use of ICT in women enterprises in Kigali, Rwanda to ensure women-owned business competitiveness was accepted. But, Hypothesis that there is a negative relationship between the constraints faced by women-owned

businesses in Kigali, Rwanda and the management of small-sized enterprises was not tested due to lack of data and future study is suggested.

Besides the findings above, based on the results, an integrated framework was constructed. It has been found that entrepreneurial skills, age of business, capital, permission from husband or family, use of ICT, and support from leadership and stakeholders for the enterprises have been described as essential factors for entrepreneurial performance and hence, for entrepreneurial development. Therefore, the model supports the TOE theory adoption of ICT in SMEs.

The current data highlights the importance of adoption of ICT into women-owned business in Kigali and how various variables come together to ensure business performance and sustainability. Since the integration of ICT is emerging among women enterprises, this work contributes to the existing body of knowledge of women entrepreneurship by providing insight into how the integration of ICT into their SMEs could improve their efficiency, effectiveness to position business, ultimately, performance, sustainability and growth of their SMEs.

This study adds to the growing body of research that indicates how leveraging ICT could intervene in finding a solution and solving of constraints experienced by women-owned SMEs.

This study identified the constraints encountered by women-owned SMEs in Kigali. It could serve as a foundation that policymakers and stakeholders could use to find sustainable solutions to constraints faced by women entrepreneurs not only in Kigali, Rwanda, but in other developing economies.

This study endorsed the recommendation that ICT could be implemented in women-owned SMEs in Kigali and other developing countries to enhance their business performance, competitiveness, market share, and find new markets.

RCWE, in collaboration with the Ministry of Health and other stakeholders, could step up health education to eradicate stigma and discrimination against women-owned SMEs living with HIV/AIDS. Entrepreneurship programmes should be updated with relevant skills to enable entrepreneurs to cope with the business environment

challenges. Women found it difficult to start a business and are called on to pay taxes immediately after opening their business doors. It is recommended that the government should provide a tax exemption for a specific period to encourage entrepreneurs to set up a business and to have cash flow.

It was difficult for women-owned small and medium-sized enterprises in Kigali to obtain a public tender. The Rwandan government appointed a female parliamentary majority and a half in the cabinet. Article 10 of the Rwandan constitution ensures that at least 30% of women are appointed to senior positions (Rwanda, 2015). Nevertheless, women are still under-represented in entrepreneurship. The government should bring women entrepreneurs to the public supply chain by providing them at least 30% of public tender. The respondents reported bribery among government officials. The corrupted should be reported, prosecuted, and punished. Overall, the study achieved the main objective by identifying the importance of ICT in women-owned SMEs in Kigali, Rwanda.

REFERENCES

Abawi, K. 2013. Data Collection Instruments (Questionnaire & Interview). http://www.gfmer.ch/SRH-Course-2012/.../Data-collection-instruments-Abawi-2013.pdf [23 January 2018].

Abed, S. 2020. Social commerce adoption using TOE framework: An empirical investigation of Saudi Arabian SMEs. *International Journal of Information Management*, 53:102-118, August.

Acharya, B. 2010. *Questionnaire design*. Tribhuvan: Tribhuvan University.

Adewoye, J., Ademola, A., Afolabi, O. & Oyeleye, O. 2013. Performance impact of information and communication technology (ICTs) on women entrepreneurs in South Western Nigeria. *Elixir International Journal*, (65):19905-19909, December.

Agbenyegah. 2013. Challenges facing rural entrepreneurship in selected areas in South Africa. Unpublished PhD thesis, North Werstern University, Potchefstroom, South Africa.

Aggarwal, R., Siddiqaliali, B.M. & Kumar, P. 2012. Technology and business incubation a proven model to promote technology innovation and entrepreneurship in Rwanda. *International Journal of Business and Public Management*, 2(2):47-50.

Ahn, J. H. & Skudlark, A. E. 1997. Resolving conflict of interests in the process of an information system implementation for advanced telecommunication services. *Journal of Information Technology*, 12(1):3-13, January. http://dx.doi.org/10.1080/026839697345170 [02 February 2021].

Ajibade, P. 2018. Technology acceptance model limitations and criticisms: Exploring the practical applications and use in technology-related studies, mixed-method, and qualitative research. *Library Philosophy & Practice*, June.

Ajimotokin, S., Haskins, A. & Wade, Z. 2015. The effects of unemployment on crime rates in the U.S. https://smartech.gatech.edu/bitstream/handle/1853/53294/theeffectsofunemployment oncimerates.pdf [18 March 2019].

Ali, Z. & Bhaskar, B. 2016. Basic statistical tools in research and data analysis. *Indian Journal of Anaesthesia*, 60(9):54-61, September.

Alliance for Financial Inclusion. 2014. *Rwanda's Financial Inclusion success story UMURENGE SACCOS*. Bangkok: Alliance for Financial Inclusion.

Alibhai, S., Buehren, N., Coleman, R., Goldstein, M. & Strobbe, F. 2019. Disruptive finance: Using psychometrics to overcome collateral constraints in Ethiopia. https://openknowledge.worldbank.org/handle/10986/29746 [12 May 2019].

Al-Qeisi, K.I. 2009. Analyzing the use of UTAUT model in explaining an online Behaviour: Internet banking adoption. Unpublished PhD thesis, Brunel University, Brunel.

Alton, L. 2019. How Technology is helping women-owned businesses around the globe grow. https://community.connection.com/how-technology-is-helping-women-owned-businesses-around-the-globe-grow/ [22 January 2020].

American Express. 2014. *The 2014 state of women-owned businesses report*. Washington: The U.S. Census Bureau.

Amit, R. & Muller, E. 2013. Push and pull entrepreneurship. *Journal of Small Business & Entrepreneurship*, 12(4):64-80.

Ang, M.C., Ramayah, T. & Amin, H. 2015. A theory of planned behavior perspective on hiring Malaysians with disabilities. Equality, diversity and inclusion: *An International Journal*, 34(3):184-200, March.

Ardic, O.P., Mylenko, N. & Saltane, V. 2011. Small and medium enterprises - World Bank documents & reports. http://www.documents.worldbank.org/curated/en/967301468339577330/pdf/WPS5538.pdf [6 May 2019].

Arkkelin, D. 2014. Using SPSS to understand research and data analysis. http://scholar.valpo.edu/psych_oer/1 [25 January 2018].

Arpaci, I., Yardimci, Y.C., Ozkan, S. & Turetken, O. 2012. Organizational adoption of information technologies: A literature review. *International Journal of ebusiness and Government Studies*, *4*(2):37-50.

Asian Development Bank. 2012. *Information and communication technologies for women entrepreneurs prospects and potential in Azerbaijan, Kazakhstan, the Kyrgyz Republic, and Uzbekistan*. Mandaluyong City: Asian Development Bank.

Asia-Pacific Economic Cooperation. 2018. *Case studies of successful women entrepreneurs in the ICT Industry in 21 APEC Economies*. Terrace: Asia-Pacific Economic Cooperation.

Avert. 2018. Global HIV and AIDS statistics. https://www.avert.org/global-hiv-and-aids-statistics [20 May 2019].

Avert. 2018. HIV stigma and discrimination. https://www.avert.org/professionals/hiv-social-issues/stigma-discrimination [20 May 2019].

Avramidis, E. & Smith, B. 1999. An introduction to the major research paradigms and their methodological implications for special needs research. *Emotional and behavioural difficulties*, *4*(3):27-36, December.

Ayong, K.T. & Naidoo, R. 2019. Modeling the adoption of cloud computing to assess South African SMEs: An integrated perspective. *Kalpa Publications in Computing*, 12:43-56, Fall.

Ayres, C. 2019. 13 Pros and Cons of Quantitative Research Methods. https://vittana.org/13-pros-and-cons-of-quantitative-research-methods [7 September 2019].

Babbie, E. 2010. *The practice of social research*. 12th ed. Wadsworth: Cengage.

Badran, M.F. 2014. *Access and use of ICT in female-owned SMEs in selected Arab Countries and Brazil: A comparative study*. Cairo: The Maastricht School of Management.

Baker, J. 2012. *The technology–organization–environment framework*. 1st ed. New York: Pringer.

Barakji, A. 2016. My startup idea got rejected, and here's what I learned. https://www.entrepreneur.com/author/abdulla-barakji [2 May 2020].

Baron, R. & Shane, N.A. 2005. *Entrepreneurship: A process perspective*. Ohio: Thompson.

Barreiro, P.L. & Albandoz, J.P. 2001. Population and sample. Sampling techniques. Seville: University of Seville.

Barringer, B. & Ireland, D. 2008. *Entrepreneurship successfully launching new ventures*. 2nd ed. London: Pearson.

Bazubagira, D. 2011. Au Rwanda, les femmes seules utilisent mieux leurs crédits. https://www.toukimontreal.com/2011/05/30/au-rwanda-les-femmes-seules-utilisent-mieux-leurs-credits/ [23 May 2019].

Beal, V. 2019. LTE network - 4G LTE. https://www.webopedia.com/TERM/4/4G_LTE.html [25 June 2019].

Ben-Ari, N. 2014. Big dreams for Rwanda's ICT sector. https://www.un.org/africarenewal/magazine/april-2014/big-dreams-rwanda%E2%80%99s-ict-sector [7 June 209].

Bentler, P.M. & Chou, C.P. 1987. Practical issues in structural modelling. *Sociological Methods & Research,* 16(1):78-117.

Bishumba, N. 2017. New app to ease networking for Rwanda women entrepreneurs. https://www.newtimes.co.rw/section/read/209361 [13 May 2019].

Bishumba, N. 2017. Poor technology hindering rural women entrepreneurship - study. https://www.newtimes.co.rw/section/read/209731 [1 June 2019].

Blackden, M., Munganyinka, T., Mirembe, J. & Mugabe, A.S. 2011. *Gender assessment*. Kigali: United States Agency for International Development or the United States Government.

Boddy, D. & Buchanan, D. A. 1986. *Managing new technology*. Oxford: Basil Blackwell.

Boice, D. 2018. How Tech can help you put the brakes on workplace sexual harassment. https://www.tlnt.com/technology-can-help-you-stop-workplace-sexual-harassment/ [9 June 2019].

Bracher, P. 2019. Prescribed rate of interest. https://www.financialinstitutionslegalsnapshot.com/2019/09/prescribed-rate-of-interest-is-10-25-from-1-january [3 December 2019].

Bradford, A. 2017. Deductive reasoning versus inductive reasoning. https://www.livescience.com/21569-deduction-vs-induction.html [29 September 2019].

Broadcasters of ICT. 2019. Girls coding boot camp Kigali Rwanda-College of science and technology. https://www.bict.rw/news/girls-coding-boot-camp [23 June 2019].

Brooks, L. 2018. Why are there so few women entrepreneurs in Rwanda? https://womenentrepreneursgrowglobal.org/2018/07/30/why-are-there-so-few-women-entrepreneurs-in-rwanda/ [23 May 2019].

Brown, J. 2016. How can I reduce my company's business phone service bill? http://www.packetworks.net/blog/how-can-i-reduce-my-company-s-business-phone-service-bill.htm [6 June 2019].

Bruhn, M., Arraiz, I. & Stucchi, R. 2016. Psychometrics as a tool to improve screening and access to credit. http://blogs.worldbank.org/allaboutfinance/psychometrics-tool-improve-screening-and-access-credit [5 June 2019].

Bryman, A. & Cramer, D. 2001. *Quantitative data analysis with SPSS Release 10 for Windows*. Abingdon: Routledge.

Bryman, A. 2012. *Social research methods*. 4th ed. Oxford: Oxford University.

Brynard, D.J., Hanekom, S.X. & Brynard, P.A. 2014. *Introduction to Research.* 3rd ed. Pretoria: Van Schaik.

Bugingo, M. E. 2018. Empowering women by supporting small-scale cross-border trade. https://www.ictsd.org/bridges-news/bridges-africa/news/empowering-women-by-supporting-small-scale-cross-border-trade [16 May 2019].

Burgess, T.F. 2001. *A general introduction to the design of questionnaires for survey research*. 1st ed. Leeds: University of Leeds.

Burns, R.B. & Burns, R.A. 2008. *Business research methods and statistics using SPSS*. Los Angeles: Sage.

Byanafashe, D., Rutayisire, P., Jyoni wa Kirenga, J., Kabwete, M.C., Kanimba, M.C., & Mbonimana, G. 2011. *Histoire du Rwanda: Des origines a la fin du XXe Sciecle*. 1st ed. Huye: Universite Nationale du Rwanda.

Byrne, B.M. 2010. *Structural equation modelling with AMOS: Basic concepts, applications, and programming*. 2nd ed. New York: Routledge.

Byumvuhore, F. (2018). Skills shortage hurting women entrepreneurship. https://www.newtimes.co.rw/business/skills-shortage-hurting-women-entrepreneurship [23 June 2019].

Callon, M. & Latour, B. 1981. Toward an integration of micro-and macro-sociologies. *Routledge & Kegan Paul*, 1:1-47, Fall.

Callon, M. 1984. Some elements of a sociology of translation: domestication of the scallops and the fishermen of St Brieuc Bay. *The sociological review*, 32(1):196-233.

Camargo, C.B. & Gatwa, T. 2018. *Informal governance and corruption - transcending the principal agent and collective action paradigms*. Basel: Basel Institute on Governance.

Cape Peninsula University of Technology. 2013. *Research ethics.* http://www.cput.ac.za/research/ethics [26 January 2018].

Carter, S. & Jones-Evans, D. 2012. *Enterprise and small business: Principles, practice and policy*. 3rd ed. Harlow: Pearson.

Central, C. 2018. Tips on how to reduce the cost of communication in your business. https://albertonrecord.co.za/191423/tips-reduce-cost-communication-business/ [6 June 2019].

Chand, S. 2019. Deductive and inductive methods of economics (merits and demerits) the deductive method. https://www.academia.edu/24677462/Deductive_and_Inductive_Methods_of_Economics_Merits_and_Demerits_The_Deductive_Method [29 September 2019].

Chell, E. 2008. *The entrepreneurial personality: a social construction*. 2nd ed. East Sussex: Routledge.

Chen, J. 2019. Cross-sectional analysis. https://www.investopedia.com/terms/c/cross_sectional_analysis.asp [25 September 2019].

Cherry, K. 2019. Cross-sectional research method: How does it work? https://www.verywellmind.com/what-is-a-cross-sectional-study-2794978 [25 September 2919].

Cherry. K. 2018. What is intrinsic motivation? http://www.psychology.about.com [25 May 2018].

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*, 14(6):835- 850, November-December.

Cisco. 2015. Women entrepreneurs' adoption and use of technology. https://www.cisco.com/.../women-entrepreneurs-adoption-and-use-of-technology.pdf [14 March 2018].

Cohn, T. & Lindberg, R. 1972. *How management is different in small companies: an AMA management briefing*. New York: American Management Association.

Collins English Dictionary. 2018. Push definition and meaning. https://www.collinsdictionary.com/dictionary/english/push [5 July 2018].

Connell, R. & Messerschmidt, J. 2005. Hegemonic masculinity: Rethinking the concept. *Gender & society*, 19(6): 829-859, December.

COOPEDU. 2012. COOPEDU - Credit femmes entrepreneurs - MFtransparency.org https://www.mftransparency.org/microfinance-pricing/rwanda/004-COOPEDU/P05-Credit_Femmes_Entrepreneurs/ [12 May 2019].

Cooper, D.R. & Schindler, P.S. 2008. *Business research methodology*. 10th ed. Boston: Mc Graw-Hill.

Cragg, P. & King, M. 1993. Small-firm computing: motivators and inhibition. *MIS Quarterly*, 17(1):47-60, March.

Creswell, J. & Creswell, J. 2017. Research design: Qualitative, quantitative, and mixed methods approaches. 5th ed. https://edge.sagepub.com/creswellrd5e [19 December 2019].

Creswell, J. W. 2003. *Research design: Quantitative, qualitative and mixed methods approaches*. 2nd ed. Thousand Oaks: Sage.

Creswell, J.W. 2012. *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. 4th ed. Boston: Pearson Education.

Crossman, A. 2019. Understanding critical theory. https://www.thoughtco.com/critical-theory-3026623 [2 September 2019].

Currency Converter. 2020. https://www1.oanda.com/currency/converter/ [10 August 2020].

Dagnino, G.B. & Cinici, M.C. 2016. *Research methods for strategic management*. London: Routledge.

Daisyme, P. 2018. 10 Tax-savings hacks that small business owners often miss. https://www.entrepreneur.com/article/307434 [6 June 2019].

Davis, F.D. 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3):319-340, September.

Davis, F.D. 1999. User acceptance of information technology: system characteristics, user perceptions and behavioral impacts. *International Journal of Man-Machine Studies*, 38(3):475-487, March.

Davis, F.D., Bagozzi, R.P. & Warshaw, P.R. 1989. User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35(8):982-1003, August.

Dawson, C. & Henley, A. 2012. "Push" versus "pull" entrepreneurship: An ambiguous distinction. *Journal of Entrepreneurial Behaviour and Research*, 18(6): 697-719, September.

Denscombe, M. 2007. *The good research guide for small-scale social research project*. 3rd ed. Berkshile: McGraw-Hill.

Deutsche Gesellschaft für Internationale Zusammenarbeit. 2019. Digital skills for entrepreneurial women. https://www.giz.de/en/workingwithgiz/75874.html [12 May 2019].

Dholakia, R. & Kshetri, N. 2001. Factors impacting the adoption of the Internet among SMEs. *Small Business Economics*, 23(4):311-322, November.

Dimitruk, P., Schermelleh-Engel, K., Kelava, A. & Moosbrugger, H. 2007. Challenges in nonlinear structural equation modelling. *Methodology*, 3(1):100-114, January.

Donna, J., Kelley., Candida, G., Brush., Green, P.G. & Litovisky, Y. 2011. *Global Entrepreneurship Monotor. 2010 Report: Women entrepreneurs worldwide*. Boston: Global Entrepreneurship Monotor.

Drucker, P. 1985. *Innovation and entrepreneurship*. London: Heinemann.

Dudovskiy, J. 2019. Deductive Approach (deductive reasoning). https://research-methodology.net/research-methodology/research-approach/deductive-approach-2/ [28 September 2019].

Dudovskiy, J. 2019. Inductive Approach (inductive reasoning). http://research-methodology.net/research-methodology/research-approach/inductive-approach-2/ [28 September 2019].

Dudovskiy, J. 2019. Positivism - Research Methodology. https://research-methodology.net/research-philosophy/positivism [28 June 2020].

Dudovskiy, J. 2019. Research Methodology. https://research-methodology.net/sampling-in-primary-data-collection/purposive-sampling [28 June 2020].

Dwivedi, Y., Rana, N., Chen, H. & Williams, M. 2011. A Meta-analysis of the Unified Theory of Acceptance and Use of Technology (UTAUT)*. IFIP international working conference on governance and sustainability in information systems-managing the transfer and diffusion of it*, Heidelberg, 22 September 2011. Berlin: Springer: 155-170.

Dwivedi, Y.K., Rana, N.P., Jeyaraj, A., Clement, M. & Williams, M.D. 2019. Re-examining the Unified Theory of Acceptance and Use of Technology (UTAUT): Towards a revised theoretical model. *Information Systems Frontiers*, 21(3):719-734, June.

Ear-Dupuy, H. & Serrat, O. 2017. Fighting corruption with ICT: Strengthening civil society's role. https://link.springer.com/chapter/10.1007/978-981-10-0983-9_86 [8 June 2018].

Edinburgh Group. 2014. *Growing the global economy through SMEs*. London: Edinburgh Group.

Eddleston, K. & Powell, G. 2012. Nurturing entrepreneurs' work–family balance: A gendered perspective. *Entrepreneurship Theory and Practice*, 36(3):513-541, May.

Erasmus, B., Strydom, J. & Rudansky-Kloppers. 2015. *Introduction to business management*. 9th ed. Cape Town: Oxford University Press.

Eriksson, P. & Kovalainen, A. 2016. *Qualitative methods in business research: A practical guide to social research*. 2nd ed. Los Angeles: Sage.

Essa, A. 2018. The politics of second-hand clothes: A debate over dignity. https://www.aljazeera.com/indepth/features/politics-hand-clothes-debate-dignity-181005075525265.html [2 June 2019].

Eze, S.C. 2013. Understanding dynamic process of emerging ICT adoption in UK service SMEs: An Actor-Network Approach. Unpublished PhD thesis, University of Bedfordshire, Bedfordshire.

Eze, S.C., Duan, Y. & Chen, H. 2014. Examining emerging ICT's adoption in SMEs from a dynamic process approach. *Information Technology & People*, 27(1):63-82, October.

Fairlie, R.W. & Fossen, M. 2017. *Opportunity versus necessity entrepreneurship: Two components of business creation*. Stanford: Stanford Institute for Economic Policy Research.

Faraj, S., Kwon, D. & Watts, S. 2004. Contested artifact: Technological sense making, actor networks and the shaping of the web browser. *Journal of Information, Technology and People*, 17(2):186-209.

Fatoki, O. 2014. Factors motivating young South African women to become entrepreneurs. *Mediterranean Journal of Social Sciences*, 5(16):184-190, July.

Fellman, A.C. 2012. Focus on Rwanda: A conference on gender research and activist. *Proceedings of the 2011 conference of the Kigali Institute of Education, Kigali, Rwanda*, *11-12 March 2011*. Kigali: 23-24.

Field, A. 2005. *Discovering statistics using SPSS*. 2nd ed. London: Sage.

Field, A. 2009. *Discovering statistics using SPSS*. 3rd ed. London: Sage.

FinScope Rwanda. 2016. *Financial inclusion in Rwanda. 2016*. Kigali: FinScope Rwanda.

Flaherty, M. 2017. Banking Rwanda's women. https://www.womensworldbanking.org/insights-and-impact/banking-rwandas-women-wants-bank/ [23 May 2019].

Foley, B. 2018. Why you should consider secondary data analysis for your next study. https://www.surveygizmo.com/resources/blog/secondary-data-analysis/ [29 September 2019].

Frank, Z. 2018. Made in Rwanda' clothes faulted for price. http://rwandatoday.africa/business/-Made-in-Rwanda--clothes-faulted-for-price/4383192-4688966-snq8ayz/index.html [2 June 2019].

Frazer, G. 2016. The boring infrastructure that Rwanda needs. https://www.theigc.org/blog/the-boring-infrastructure-that-rwanda-needs/ [16 May 2019].

Freedman, S., Weinstein, H. & Longman, T. 2006. *The teaching of history of Rwanda a participatory approach: A resource book for teachers*. Berkeley: University of California.

Freeman, I. & Hasnaoui, A. 2010. ICT - Hal. https://hal.archives-ouvertes.fr/hal-00495968/document [18 April 2018].

Freeman, R. E. 1984. *Strategic management: A stakeholder approach*. Boston: Pitman.

Frynas, J. & Mellahi, K. 2015. *Global strategic management*. 3rd ed. New York: Oxford University Press.

Galbraith, A. 2018. Small business owner. Why you need computer skills. https://www.entrepreneurmag.co.za/advice/doing-business-in-sa/technology-doing-business-in-sa/small-business-owner-why-you-need-computer-skills/ [11 June 2019].

Gara, A. K. 2013. Girls in ICT Rwanda. https://www.itu.int/en/ITU-D/Digital-Inclusion/Women-and-Girls/Girls-in-ICT-Portal/Documents/2013/Africa/girlsinictday2013-summary%20rwanda%202013.pdf [22 June 2010]

Gaye, D. 2018. Les femmes entrepreneures: Avenir du continent africain. https://www.banquemondiale.org/fr/news/opinion/2018/11/29/women-entrepreneurs-the-future-of-africa [1 June 2019].

George, D. & Mallery, P. 2010. *SPSS for Windows step by step: a simple guide and reference, 17.0 update*. Boston: Allyn & Bacon.

German. Federal Minister for Economic Cooperation and Development. 2013. *Information and communications technology (ICT) key technologies for sustainable development*. Berin: Federal Minister for Economic Cooperation and Development.

Geuss, R. 1981. *The idea of a critical theory*: *Habermas and Frankfurt School.* Cambridge: Cambridge University.

Ghobakhloom, M., Zulkifli, N. & Aziz, F. 2010. The interactive model of user information technology acceptance and satisfaction in small and medium-sized enterprises. *European Journal of economics, finance and administrative sciences*, 19(1):7-27.

Giesler, M. 2012. How doppelgänger brand images influence the market creation process: Longitudinal insights from the rise of Botox Cosmetic. *Journal of Marketing*, 76(6):55-68.

Global Entrepreneurship Research Association. 2012. *Global Entrepreneurship Monitor 2012 Women's Report*. Boston: Global Entrepreneurship Monotor.

Goldman Sachs. 2018. Goldman Sachs 10,000 women launches online education partnership with coursera. https://www.goldmansachs.com/media-relations/press-releases/archived/2018/coursera-launch-may-21-2018.html [5 June 2019].

Goswami, A. & Dutta, S. 2015. ICT in Women Entrepreneurial Firms - A Literature Review. *IOSR Journal of Business and Management (IOSR-JBM*), 17(2):38-41, February.

GovDocs. 2014. Can workers record video or audio in the workplace? https://www.govdocs.com/can-employees-record-video-audio-workplace/ [9 June 2019].

Greener, S. 2008. Business Research Methods. https://kosalmath.files.wordpress.com/2010/08/introduction-to-research-methods.pdf [19 January 2018].

Grewal, R., Cote, J.A., & Baumgartner, H. 2004. Multicollinearity and Measurement Error in structural equation models: Implications for theory testing. *Marketing Science, 23*(4):519–529, November.

Gunderson, G.B. 2015. Entrepreneurs: Stop overpaying on taxes. https://www.forbes.com/sites/groupthink/2015/06/09/entrepreneurs-stop-overpaying-on-taxes/#2963c2c3f708 [6 June 2019].

Hair, J.F., Tatham, R.L., Anderson, R.E. & Black, W.C. 1995. *Multivariate data analysis*. 4th ed. New York: Prentice Hall.

Hair, J.F., Tatham, R.L., Anderson, R.E. & Black, W.C. 1998. *Multivariate data analysis*. 5th ed. New York: Prentice Hall.

Hakuzimana, D. 2017. Specific problems of female entrepreneurs in Northern Province of Rwanda-Musanze District. *International Journal of Scientific and Research Publications*, 7(6): 283-291, June.

Hampel-milagrosa, A. 2009. *Gender issues in Doing Business : An analysis using case studies of Ghanaian women entrepreneurs*. Bonn: German Development Institute.

Haradhan, M. 2017. Two criteria for good measurements in Research: Validity and reliability. *Annals of Spiru Haret University. Economic Series*, 17(4):59-82.

Harlacher, J. 2016. *An educator's guide to questionnaire development*. Washington, DC: Department of Education.

Harris, S. 2018. How women entrepreneurs can overcome obstacles and ensure success. https://born2invest.com/articles/women-entrepreneurs-ensure-success/ [4 June 2019].

Hershberger, S.L. 1994. *The specification of equivalent models before the collection of data*. Thousand Oaks, CA: Sage.

Hightower, C. & Scott, K. 2012. Infer more, describe less: More powerful survey conclusions through easy inferential tests. *Issues in Science and Technology Librarianship*, 69: 0-22, Fall.

Hirwa, P. 2010. The impact of women entrepreneurs on economic development of Rwanda: A case study of women entrepreneur in expo 2010 organised by Rwanda private sector federation. Unpublished Master's thesis, National university of Rwanda, Butare.

Hope Magazine. 2017. SheTrades Rwanda launched to connect women entrepreneurs. http://www.hope-mag.com/index.php?com=news&option=read&ca=1&a=2952 [25 June 2019].

Horkheimer, M. 2002. *Critical theory: Selected essays*. New York: Continuum.

Horn, N. 2018. The immense value behind data enrichment with secondary data. https://www.inzata.com/the-immense-value-behind-data-enrichment-with-secondary-data/ [29 September 2019].

Hox, J.J., Borgers, N. & Bergh, B. 2001. Testing measurement and structural equivalence in different age groups of children. *Kwantitatieve Methoden*, 67:65-80 Fall.

Hoxha, D. & Capelleras, J.L. 2010. Fast-growing firms in a transitional and extreme environment: are they different? *Journal of small business and enterprise development*, 17(3):350-370, August.

Hughes, C. 2003. *Introduction to research methodologies*. Warwick: University of Warwick.

Huye, S. & Sikoska, T. 2003. Overcoming the Gender Digital Divide: Understanding ICTs and their Potential for the Empowerment of Women. http://www.un-instraw.org/en/research/gender_and_ict/virtual_seminars.html [2 June 2018].

Imre, Ö. 2017. *Adopting information systems perspectives from small organizations electronic press*. Linköping: Linköping University Electronic Press.

International Business Machines Corporation SPSS Statistics. 2017. IBM SPSS Statistics product catalogue decisions—better outcomes through predictive analytics.

https://www.file:///C:/Users/user/Documents/Dropbox/ytz03001-usen-13_YTZ03001USEN.pdf [26 April 2020].

International Business Machines Corporation SPSS. 2010. *IBM SPSS data preparation*. https://www.csun.edu/sites/default/files/data-preparation19.pdf [22 September 2019].

International Finance Corporation. 2008. *Voice of women entrepreneurs in Rwanda*. Washington: World Bank.

International Labour Office. 2015. *Small and medium-sized enterprises and decent and productive employment creation*. Geneva: International Labour Office.

Ipsos Strategic Marketing. 2011. *Women entrepreneurship in Montenegro*. Podgorica: Montenegro. Ministry for Human and Minority Rights.

Irani, Z., Love, P.E., Li, H., Cheng, E.W. & Tse, R.Y. 2001. An empirical analysis of the barriers to implementing e-commerce in small-medium sized construction contractors in the state of Victoria, Australia. *Journal of Construction Innovation*, 1(1):31- 41, March.

Istanbul, A.D. 2015. The role of Palestinian women entrepreneurs in business development. Unpublished PhD thesis, University of Granada, Granada.

Jacobson, J. & Joekes, S. 2019. *Violence against women traders at border Crossings*. London, UK: WOW Helpdesk

Jaganathan, M., Ahmad, S., Ishak, K.A., Nafi, S.N.M. & Uthamaputhran, O. 2018. Determinants for ICT adoption and problems: evidence from rural based small and medium enterprises in Malaysia. *International Journal of Entrepreneurship*, 22(4):1-13.

Jayaraj, A., Rottman, J. & Licit, M. 2006. A review of the predictors, linkages, and biases in IT innovation adoption research. *Journal of Information Technology*, 21(1): 1-23, February.

Jelonek, D. 2013. Synergistic effect in alignment between business environment scanning strategy and IT strategy in enterprises, *Tourism & Management Studies*, 9(1):116-120.

Jensen, E.A. & Laurie, C. 2016. *Doing real research*. 1st ed. London: Sage.

Johnson, C.C. 2019. 3 resources to help find small-business loans for women entrepreneurs. https://www.americanexpress.com/en-us/business/trends-and-insights/articles/3-resources-to-help-find-small-business-loans-for-women-entrepreneurs/ [5 June 2019].

Kabagambe, A.M. 2019. How to detect sexual harassment at the work place. https://www.newtimes.co.rw/lifestyle/how-detect-sexual-harassment-work-place [15 May 2019].

Kagan, J. 2019. Collateral definition - Investopedia. https://www.investopedia.com/terms/c/collateral.asp [24 May 2019].

Kaliisa, S. 2019. We Code: Changing the female narrative in digital technology. https://www.newtimes.co.rw/lifestyle/we-code-changing-female-narrative-digital-technology [13 May 2019].

Kamberidou, I. 2020. Distinguished women entrepreneurs in the digital economy and the multitasking whirlpool. *Journal of Innovation and Entrepreneurship*, 9(1):1-26, January.

Kantengwa, S. 2016. Call for scaling-up of HIV prevention, treatment services in the workplace. https://www.newtimes.co.rw/section/read/200189 [20 May 2019].

Kantengwa, S. 2016. Mushimiyimana on balancing work and family. https://www.newtimes.co.rw/section/read/202302 [1 July 2019].

Karuranga, J. 2018. Report urges greater action on corruption. https://www.newtimes.co.rw/news/report-urges-greater-action-corruption [19 May 2019].

Keller, G. 2009. *Managerial statistics*. 8th ed. Mason: Cengage Learning.

Kelley, D., Brush, C., Greene, P., Herrington, M., Ali, A. & Kew, P. 2015. *Special report women's entrepreneursh*ip. Boston: Global Entrepreneurship Monitor.

Kelley, D., Candida, G., Brush; Patricia, G., Greene. & Litovsky, Y. 2011. *2010 Report: Women Entrepreneurs Worldwide Executive*. Babson: Global Entrepreneurship Monitor.

Kelley, D.J., Baumer, B.S., Brush, C., Greene, P.G., Mahdavi, M., Majbouri, M., Cole, M., Dean, M. & Heavlow, R. 2017. *Global Entrepreneurship Monitor 2016/2017 report on women's entrepreneurship*. Boston: Global Entrepreneurship Monitor.

Kent State University. 2019. Data creation in SPSS - SPSS tutorials. Kent: Kent State University.

Kiran, Q. 2018. Role of ICTs in women's economic empowerment: The case of grameen phones Bangladesh. https://wpmu.mah.se/nmict181group1/icts-women-economic-empowerment-grameen-phones-bangladesh/ [14 June 2019].

Kishore, K. & Lokesha, N. 2016. How to create an online by using Google forms. *International Journal of Library and Information Science*, 6(3):118-126.

Kline, R.B. 1998. *Principles and practice of structural equation modelling*. New York: Guilford Press.

Kuan, K. & Chau, P. 2001. A perception-based model for EDI adoption in small businesses using a technology-organisation-environment framework. *Information and Management*, 38(8):507-521, October.

Kumalo, N.H. 2018. The role of cloud computing in addressing small, medium enterprise challenges in South Africa. Unpublished PhD thesis, University of Pretoria., South Africa.

Kumar, R. 2011. *Research methodology: A step-by-step guide for beginners*. 3rd ed. London: Sage.

Kwibuka, E. 2015. How 'New Faces, New Voices' will impact the Rwandan woman. https://www.newtimes.co.rw/section/read/189980 [25 May 2019].

Lancaster, H. 2019. *Rwanda - telecoms, mobile and broadband - statistics and analyses.* Sydney: BuddeComm.

Landau, S. & Everitt, B.S. 2009. *A Handbook of Statistical Analyses using SPSS*. London: Chapman.

Larson, E. & Gray, C.F. 2014. *Project management: The managerial process*. 6th ed. New York: McGraw-Hill Education.

Lee, S. and Hershberger, S. 1990. A simple rule for generating equivalent models in covariance structure modelling m*ultivariate Behavioral Research*, 25(1):313-334, July.

Lionnesses of Africa. 2016. Meet 20 women entrepreneurs who are spearheading a new entrepreneurial spirit in Rwanda. http://www.lionessesofafrica.com/blog/2016/4/15/meet-20-women-entrepreneurs-who-are-spearheading-a-new-entrepreneurial-spirit-in-rwanda [24 November 2019].

Littlejohn, S.W. 1992. *Critical theories in theories of human communication*. 4th ed. Belmont, CA: Wadsworth.

Lunceford, B. 2009. Reconsidering technology adoption and resistance: Observations of a semi-luddite. *Explorations in Media Ecology*, 8(1):29-47, March.

Lyytinen, K. & Damsgaard, J. 2001. *What's wrong with the diffusion of innovation theory*. Boston: Spring.

Macionis, J.J. & Gerber, L.M. 2011. *Sociology*. 7th ed. Toronto: Pearson.

Mahadea, S & Youngleson, A. 2013. *Entrepreneurship and small business management*. Cape Town: Pearson.

Malunda, D. 2011. *Evaluation of Rwanda's youth and employment policies*. Kigali: Institute of Policy Analysis and Research.

Malunda, D. 2014. *Innovative approaches to creating opportunities and incorporating young youth into Rwanda's labour markets*. Kigali: Institute of Policy and Analysis.

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*, 5(27):1187-1193.

Marchall, M.N. 1996. Sampling for Research Qualitative. *Family Practice*, 13(6):522-525.

Maree, K. 2007. *First steps in research*. 1st ed. Pretoria: Van Schaik.

Marres, N. 2004. Tracing the trajectories of issues, and their democratic deficits, on the web: The case of the development gateway and its doubles. *Information Technology & People*, 17(2):1-29, June.

Martel, D. 2019. Maslow's hierarchy of entrepreneurial needs. https://www.danmartell.com/hierarchy-of-entrepreneurial-needs/ [22 November 2019].

Martin, L. & Wright, l.T. 2005. No gender in Cyberspace? Empowering entrepreneurship and innovation in female-run ICT small firms. *International Journal of Entrepreneurial Behaviour & Research*, 11(2):162-178.

Martinez, I. & Nguyen, T. 2014. *Using information and communication technology to support women's entrepreneurship in central and west Asia*. Mandaluyong: The Asian Development Bank.

Marzocchi, O. & Bonewit, A. 2015. *Empowering women on the Internet*. http://www.europarl.europa.eu/supporting-analyses [17 May 2018].

Mathers, N., Fox, N. & Hunn, A. 2007. *Surveys and questionnaires*. Midlands: National Institute for Health Research.

Mbabazi, D. 2015. *New initiative to support women entrepreneurs launched in Kigali*. https://www.newtimes.co.rw/section/read/186607 [14 May 2019].

Mbabazi, D. 2018. Sexual harassment: The woes of a young woman looking for employment. https://www.newtimes.co.rw/lifestyle/sexual-harassment-woes-young-woman-looking-employment [15 May 2019].

Mbabazi, D. 2018. Why women in business are on the lighter side of the seesaw. https://www.newtimes.co.rw/lifestyle/women-business-seesaw [23 May 2019].

Mbabazi, D. 2019. Career women's network Kigali: Inspiring women for greater career goals. https://www.newtimes.co.rw/lifestyle/career-womens-network-kigali-inspiring-women-greater-career-goals [3 June 2019].

Mbabazi, D. 2019. Marriage: A man's perspective. https://www.newtimes.co.rw/lifestyle/marriage-mans-perspective [7 March 2019].

McClelland, D. 1987. Characteristics of successful entrepreneurs. *The Journal of Creative Behavior*, 21(3):219-233.

McKee, S. 2015. Are you using a questionnaire or survey to collect data? https://www.surveygizmo.com/resources/blog/taking-the-question-out-of-questionnaires/ [17 September 2019].

McNeese, B. 2016. Are the Skewness and Kurtosis Useful Statistics? https://www.spcforexcel.com/knowledge/basic-statistics/are-skewness-and-kurtosis-useful-statistics [2 July 2020].

Messabia, N. & Elbekkali, A. 2010. Information technology governance: A stakeholder approach. In An Enterprise Odyssey. *International Conference Proceedings, University of Zagreb, Faculty of Economics and Business, 26 May 2010*. Zagreb: University of Zagreb: 979-997.

Mill, J.S. 2005. Auguste Comte and Positivism. http://library.um.edu.mo/ebooks/b21819853.pdf [18 October 2019].

Mishra, A. & Mishra, D. 2013. Applications of stakeholder theory in information systems and technology. *Engineering Economics*, 24(3):254-266, June.

Misner, I. 2018. What is business networking. https://ivanmisner.com/business-networking-defination/ [13 May 2019].

Mlambo-Ngcuka, P. 2018. Reshaping the future: Women, girls and tech for development. https://news.itu.int/reshaping-future-women-girls-icts/ [4 June 2019].

Mohanty, A.R. 2019. Evaluation of challenges faced by Irish SMEs in the hospitality industry while adopting cloud computing. Unpublished Master's degree, Dublin Business School, Dublin.

Mohr, P. & Louis, F. 2008. *Economics for South Africa students*. 4th ed. Pretoria: Van Schaik.

Mouton, J. 2001. *How to succeed in your Master's & Doctoral studies*. 1st ed. Pretoria: Van Schaik.

MTN Rwanda. 2015. ITC's SheTrades initiative launched in Rwanda. http://www.mtn.co.rw/old/Content/Pages/458/49 [15 April 2019].

Muhayimana, V. & Kimemia, M. 2015. Women entrepreneurs' support projects and their contribution on the welfare of the beneficiaries in Rwanda. *European Journal of Academic Essays*, 2(8):6-17.

Muhire, B. 2018. Employment on manufacturing and service firms in Rwanda. In Heshmati, A. (ed). *Rwanda handbook of economic and social policy*. Jönköping: Jönköping International Business School: 561-594.

Muhoza, C. 2019. Feminism, radical feminism and gender equality. https://www.newtimes.co.rw/lifestyle/feminism-radical-feminism-and-gender-equality [23 May 2019].

Muhura, A. 2017. Tigo Rwanda: Empowering women agents. https://www.gsma.com/mobilefordevelopment/programme/connected-women/tigo-rwanda-empowering-women-agents/ [22 June 2019].

Mukama, J.A. 2017. Contribution of women entrepreneurs on socio-economic development of Rwanda through urwego opportunity bank (2011-2015). Unpublished Master's thesis, University of Rwanda, Kigali.

Mukamana, L., Sengendo, M. & Okiria, E. 2017. Control over the utilization of the loan and the pattern of the gendered division of labor in the loan-funded activity: A case of Duterimbere MFI in Rwanda. *Cogent Social Sciences*, 3(1):1-25, January.

Mukashema, I. & Sapsford, R. 2013. Marital conflicts in Rwanda: points of view of Rwandan psycho-socio-medical professionals. *Procedia-Social and Behavioral Sciences*, 82(1):49-68, July.

Mumporeze, N. & Prieler, M. 2017. Gender digital divide in Rwanda: A qualitative analysis of socio-economic factors. *Telematics and Informatics*, 34(7):1285-1293.

Muniesa, F. 2015. *"Actor-Network Theory", in James D. Wright (Ed.), The International encyclopaedia of social and behavioral sciences*. 2nd ed. Oxford: Elsevier.

Musomandera. L., Shukla, J. & Luvanda, A. 2015. Microfinance and business growth of women small and medium enterprises's in Rwanda. *European Journal of Accounting, Auditing and Finance Research*, 3(11):26-39, November.

Mutambuka, D., Kalisa, F. & Habimana, T. 2016. The contribution of women entrepreneurship in family socio-economic development in rural areas, Rwanda. *International Journal of Innovation, Management and Technology*, 7(6):256-259, December.

Naicker, V. 2010. The use of computers among secondary school educators in the Western Cape central metropole, Cape Town. Unpublished PhD thesis, University of the Western Cape, Cape Town, South Africa.

Nani, G. 2011. Challenges faced by urban Zimbabwe women entrepreneurs. Unpublished PhD thesis, University of Free State, Bloemfontein., South Africa.

National Women's Business Council, 2015. *The tipping point for women's entrepreneurs*. Washington, D.C: National Women's Business Council.

Ndagijimana, J., Nzasingizimana, T. & Heshmati, A. 2018. An analysis of the Determinants of youth employment in Rwanda. In Heshmati, A. (ed). *Rwanda Handbook of Economic and Social Policy*. Jönköping: Jönköping International Business School: 595-610.

Ndisanze, O. 2017. Women entrepreneurs and economic development in Rwanda: A case of Gicumbi district. *International Journal of Research in Social Sciences and Humanities*, 7(1):10-25.

Nefesh-Clarke, L. 2017. Digital technologies can be a 21st century game-changer for women. https://www.friendsofeurope.org/publication/digital-technologies-can-be-21st-century-game-changer-women [14 June 2019].

Newell, S. 2001. Management fads and fashions. *Organisation*, 8(1):5-15.

Newman, T. 2018. Sex and gender: What is the difference? https://www.medicalnewstoday.com/articles/232363.php [22 May 2019].

Ngoboka, I. 2013. Women entrepreneurs acquire computer skills. https://www.newtimes.co.rw/section/read/71061 [1 June 2019].

Nguyen, T.U.H. 2009. Information technology adoption in SMEs: An integrated framework. *International Journal of Entrepreneurial Behaviour & Research*, 15(2): 162-186, March.

Nieman, G. & Nieuwenhuizen, C. 2009. *Entrepreneurship: A South Africa Perspective*. 2nd ed. Pretoria: Van Schaik.

Nieman, G., Hough, J. & Nieuwenhuizen, C. 2003. Entrepreneurship: A South Africa perspective. 1st ed. Pretoria: Van Schaik.

Nieuwenhuizen, C. & Nieman, G. 2014. *Entrepreneurship: A South Africa Perspective*. 3rd ed. Pretoria: Van Schaik.

North Carolina State University. 2018. Bias-based bullying does more harm, is harder to protect against. Science Daily. https://www.sciencedaily.com/releases/2018/11/181114120323 [5 March 2019].

Nsengimana, P.J. 2018. How Westerners benefit by ensuring African phone calls remain expensive. http://rwandatoday.africa/opinion/How-Westerners-benefit-from-expensive-African-phone-calls/4383220-4726802-format-xhtml-c3n51v/index.html [18 May 2019].

Nsengimana, S. 2017. Challenges to women entrepreneurship in Kigali, Rwanda. Unpublished Master's thesis, Cape Peninsula University of Technology, Cape Town, South Africa.

Nsengimana, S., Iwu, C.G. & Tengeh, R.K. 2019. The factors contributing to the low numbers of women entrepreneurs in Kigali. *Acta Universitatis Danubius. Œconomica*, 15(6):97-113, October.

Nsengimana, S., Tengeh, R.K. & Iwu, C.G. 2017. The sustainability of businesses in Kigali, Rwanda: An analysis of the barriers faced by women entrepreneurs. *Sustainability*, 9(8):1-9, August.

Ntirenganya, E. 2019. Rwanda intensifies war on cybercrime. https://www.newtimes.co.rw/news/rwanda-intensifies-war-cybercrime [18 June 2019].

Okafor, D., Nico, M. & Azman, B. 2016. The influence of perceived ease of use and perceived usefulness on the intention to use a suggested online advertising workflow. *Canadian International Journal of Science and Technology*, 6(14):162-174.

O'Leary-Kelly, S.W. and Vokurka, R.J. 1998. The empirical assessment of construct validity. *Journal of Operations Management*, 16(4):387-405, July.

Omarjee, L. 2019. MTN, Vodacom to slash data prices or face prosecution; all providers must give free data daily. https://www.fin24.com/Companies/mtn-vodacom-to-slash-prices-or-face-prosecution-all-providers-must-give-free-data-daily-competition-watchdog-20191202-2 [8 December 2019].

Ommundsen, K. & Kteily, K. 2018. How women entrepreneurs are advancing the Arab World's startup scene. https://news.itu.int/female-entrepreneurs-arab-world/ [4 June 2019].

Organisation for Economic Co-operation and Development. 2002. *Management training in SMEs*. Paris: Organisation for Economic Co-operation and Development.

Organisation for Economic Co-operation and Development. 2018. *Bridging the digital gender divide*. Paris: Organisation for Economic Co-operation and Development.

Oster, S. & Wang, S. 2016. How women won a leading role in China's venture capital industry: Women launch more than half of all new Internet companies in China. https://www.bloomberg.com/news/features/2016-09-19/how-women-won-a-leading-role-in-china-s-venture-capital-industry [25 April 2019].

PanorActu. 2018. Rwanda – Des jeunes entrepreneurs partagent leur expérience avec des étudiants universitaires. http://www.panoractu.com/2018/06/11/rwanda-jeunes-entrepreneurs-partagent-experience-etudiants-universitaires/ [12 May 2019].

Petch, N. 2016. The five stages of your business lifecycle: Which phase are you in? https://www.entrepreneur.com/article/271290 [2 May 2020].

Phrasisombath, K. 2009. Sample size and sampling methods. Vientiane: Faculty of Postgraduate Studies and Research University of Health Sciences.

Pienaar, W. & Vogt, J. 2012. *Business logistics management: A value chain perspective*. 4th ed. Cape Town: Oxford University Press.

Plooy, G. 2009. *Communication Research: techniques, methods and application*. 2nd ed. Cape Town: Juta.

Polonsky, M.J. & Waller, D.S. 2011. *Designing and managing a research project: A business student's guide*. 2nd ed. Los Angeles: Sage.

Premkumar, G. 2003. "A meta-analysis of research on information technology implementation in small business". *Journal of Organisation Computing and Electronic Commerce*, 13(2):91-121, June.

Prins, J. 2013. NIST/SEMATECH e-Handbook of Statistical Methods. http://www.itl.nist.gov/div898/handbook/eda/section3/eda357.htm [2 July 2020].

Private Sector Federation. 2018. Training and development. https://www.psf.org.rw/services/training-and-development/ [31 May 2019].

Pro-Femmes /Twese Hamwe. 2019. Gender Equality and Women Empowerment Project. http://www.profemmes.org/spip.php?page=programs&id_article=23 [23 May 2019].

Rahman, S.M.A. 2016. Leveraging ICTs for empowering women entrepreneurs in Bangladesh: a review of recent developments and way forward. *European Journal of Business and Social Sciences*, 5(3):1-15, June.

Ramdani, B., Chevers, D. & Williams, D. 2013. SMEs' adoption of enterprise applications: A technology-organisation-environment model. *Journal of Small Business and Enterprise Development*, 20(4):735-753, October.

Rant, M.B. 2013. Research Methodology. Hidden Champions in CEE and Turkey: 9-18. http://link.springer.com/10.1007/978-3-642-40504-4_2. [16 April 2018].

Rashmi, D. 2016. Women entrepreneur in micro, small and medium enterprises in India: An overview. *International Journal of Managerial Studies and Research*, 4(2):60-64.

Rasoft Inc. 2004. Sample size calculator by Raosoft Inc. http://www.raosoft.com/samplesize.html [15 September 2019].

Reinartz, W.J., Haenlein, M & Henseler, J. 2009. An empirical comparison of the efficacy of covariance-based and variance-based SEM. *International Journal of Market Research*, 26(4):332-344, December.

Roberts, B. 2019. Best tax software for small businesses: 2019 guide. https://www.carefulcents.com/best-tax-software-for-small-businesses/ [6 June 2019].

Rogers, E. 1962. *Diffusion of innovation*. 1st ed. Now York: Free Press of Glencoe.

Rogers, E. 2003. *Diffusion of innovation.* 5th ed. New York: Simon and Schuster.

Ross, S. 2018. How does an entrepreneur pay taxes? https://www.investopedia.com/ask/answers/032515/how-does-entrepreneur-pay-taxes.asp [5 June 2019].

Rudy, K. 2012. What goes up, must come down… preserve your business cash flow. https://whangareibusinesssales.co.nz/how-to-increase-your-business-cashflow/ [21 November 2019].

Ruhara, C.M. & Kayitana, C.R. 2018. Mind-set and entrepreneurial activities in Rwanda: A firm level investigation. In Heshmati, A. (ed). *Rwanda Handbook of Economic and Social Policy*. Jönköping: Jönköping International Business School: 671-684.

Ruhara, M.C., Umurungi, P., Kazarwa, S., Kayitana, C., Dukunde, A. & Ndikubwimana, J.B. 2018. Impact of access to financial services on business development in Rwanda. *Scientific Journal*, (2522):1-14, May.

Rukundo, J.B. 2015. Understanding informal sector employment in Rwanda. *International Review of Research in Emerging Markets and the Global Economy*, 1(2):295-309, September.

Rwabugiri, N. 2018. For the first time, MTN Rwanda is hearing footsteps. https://medium.com/@NtareRwabugiri/for-the-first-time-mtn-rwanda-is-hearing-footsteps-40ba30788f3e [25 June 2910].

Rwahigi, M. 2014. Free online business registration now mandatory. http://www.hope-mag.com/index.php?com=news&option=read&ca=6&a=1542 [6 April 2020].

Rwanda CARE. 2016. Rwanda CARE. http://www.care.org/sites/default/files/documents/care_rwanda_country_office_fact_sheet_.pdf [24 May 2019].

Rwanda Chamber of Women Entrepreneurs. 2019. RCWE is the only umbrella organization of all women entrepreneurs in Rwanda. http://rcwe.org/index.php/2014-09-10-15-45-37/new-to-rwce [21 January 2019].

Rwanda. 2018. Regulation n°001/r/stdcmr/rura/018 of 06/07/2018. Kigali: *Government Gazette*.

Rwanda. 2001. Governing telecommunications. Law of 44/2001 30/11/2001. *Government Gazette*, 2001(44):1-39, November 30.

Rwanda. 2008. Law N° 59/2008 of 10/09/2008 on prevention and punishment of gender- based violence. *Government Gazette*, 2009(14):1-25, April 6.

Rwanda. 2015. The Constitution of the Republic of Rwanda of 2003 revised in 2015. *Government Gazette*, 1-158, December 24.

Rwanda. 2016. Law N° 24/2016 of 18/06/2016 governing information and communication technologies. *Government Gazette*, 2016(26):1-221, July 27.

Rwanda. 2017. Law N° 02/2017 of 18/02/2017 establishing Rwanda information society authority and determining its mission, organisation and functioning. *Government Gazette*, 2017(10):1-23, March 6.

Rwanda. 2017. Law Nº 26/2017 of 31/05/2017 establishing the national cyber security authority and determining its mission, organisation and functioning. *Government Gazette*, 2017(27):1-20, July 3.

Rwanda. 2018. Law N° 66/2018 of 30/08/2018 regulating labour in Rwanda. *Government Gazette*, 2018(66):1-104, September 6.

Rwanda. 2018. Regulation N°001/R/STDCMR/RURA/018 of 06/07/2018 governing unsolicited commercial communications in Rwanda. *Government Gazette*, 2018(31):1-24, July 30.

Rwanda. City of Kigali. 2019. http://www.kigalicity.gov.rw/index.php?id=57 [8 October 2019].

Rwanda. Ministry of Finance and Economic Planning. 2019. *The 2019 Voluntary national review report*. Kigali: Rwanda government.

Rwanda. Ministry of Gender and Family Promotion. 2010. Republic of Rwanda Ministry of Gender and Family Promotion - ILO. https://www.ilo.org/dyn/natlex/docs/ELECTRONIC/94009/110188/F-1576743982/RWA-94009.pdf [23 May 2019].

Rwanda. Ministry of Health. 2018. *National HIV / AIDS targets 2018-2020-2030 towards ending the AIDS epidemic in Rwanda by 2030*. Kigali: Ministry of Health.

Rwanda. Ministry of Health. 2018. *Rwanda strategic plan for HIV extended to 2020*. Kigali: Ministry of Health.

Rwanda. Ministry of Infrastructure. 2018. *Energy sector strategic plan 2018/19 - 2023/24*. Kigali: Ministry of Infrastructure.

Rwanda. Ministry of Infrastructure. 2019. *Electricity access*. Kigali: Ministry of Infrastructure.

Rwanda. Ministry of Trade and Industry. 2010. Small and medium enterprises (SMEs) development policy.http://minicom.gov.rw/fileadmin/minicom.../policies/SME Devt policy V180610 [12 December 2018].

Rwanda. Ministry of Trade and Industry. 2010. *Small and medium enterprises development policy*. http://minicom.gov.rw/fileadmin/minicom.../policies/SME Devt policy V180610 [30 July 2018].

Rwanda. Ministry of Trade and Industry. 2017. *Made in Rwanda policy*. Kigali: Ministry of Trade and Industry.

Rwanda. National Bank of Rwanda. 2019. Financial inclusion & financial education. https://www.bnr.rw/index.php?id=353 [11 May 2019].

Rwanda. National institute of statistics of Rwanda. 2014. *Fourth population and housing census*. Kigali: National institute of statistics of Rwanda.

Rwanda. National Institute of Statistics of Rwanda. 2018. *Establishments census*. Kigali: National Institute of Statistics of Rwanda.

Rwanda. National Institute of Statistics. 2016. *National gender statistics report 2016*. Kigali: Rwanda.

Rwanda. Office of president of republic. 1999. *The unity of Rwandans - before the colonial period and under the colonial rule - under the first republic*. Kigali: Rwanda.

Rwanda. Office of the Ombudsman. 2019. How denounce corruption. https://www.ombudsman.gov.rw/en/?How-denounce-corruption [8 June 2019].

Rwanda. Office of the ombudsman-Rwanda. 2019. *How denounce corruption*. Kigali: Office of the ombudsman-Rwanda.

Rwanda. *Office of the President. 2015. National ICT strategic and action plan.* Kigali: Office of the President.

Rwanda. Rwanda Biomedical Centre. 2018. A healthy - Rwanda Biomedical Center. http://rbc.gov.rw/fileadmin/user_upload/bulletin/2018/Health%20Outlook%20Magazine%20-%20Issue%20009.pdf [10 June 2019].

Rwanda. Ministry of Trade and Industry. 2013. *Rwanda private sector development strategy 2013-18*. Kigali: Ministry of Trade and Industry.

Rwigema, H., Urban, B. & Venter, R. 2008*. Entrepreneurship theory in practice*. 2nd ed. Cape Town: Oxford University Press.

Rwirahira, R. 2018. High tax, red tape force Rwandan women entrepreneurs out of the market. https://www.newsdeeply.com/womensadvancement/articles/2018/03/15/high-tax-red-tape-force-rwandan-women-entrepreneurs-out-of-the-market [27 May 2019].

Rwirahira, R. 2018. How Rwanda's government hinders female entrepreneurs. https://psmag.com/social-justice/how-rwanda-is-stopping-female-entrepreneurs [1 November 2018].

Sandie, W.E. 2016. Questionnaire design. How to design a questionnaire for needs assessments in humanitarian emergencies. https://www.acaps.org/sites/acaps/files/resources/files/acaps_technical_brief_questionnaire_design_july_2016_0.pdf [16 September 201].

Saunders, M., LewisMark, P. & Thornhill, A. 2009. *Research methods for business students*. 5th ed. Harlow: Pearson.

Sarker, S., Sarker, S. & Sidorova, A. 2006. Understanding business process change failure: An actor-network perspective. *Journal of management information systems*, *23*(1):51-86, June.

Sarokin, D. 2019. The disadvantages of using technology in business. https://smallbusiness.chron.com/disadvantages-using-technology-business-23450.htm [17 June 2019].

Sasakawa Peace Foundation. 2017. *Growing women's entrepreneurship through ICT in Southeast Asia*. Tokyo: Sasakawa Peace Foundation.

Serumaga-Zake, P.A.E. 2016. *Business research module - quantitative research*. Pretoria: UNISA.

Setyaningsih, I.C. & Kemal, N. 2019. Green manufacturing's adoption framework for small and medium enterprises in Indonesia. *Proceedings of the International Conference on Industrial Engineering and Operations Management*. Bangkok: IEOM Society International.

Shange, J. 2015. Handicraft Cooperatives Movement in Rwanda: The Boat Has to Stay Afloat before it Takes on any Passengers. *Donnish Journal of African Studies and Development*, 1(3):15-20, June.

Sincero, S.M. 2019. Advantages and disadvantages of surveys. https://explorable.com/advantages-and-disadvantages-of-surveys [18 September 2019].

Sincero, S.M. 2019. Surveys and questionnaires. https://explorable.com/surveys-and-questionnaires [17 September 2019].

Sjöström, J. & Goldkuhl, G. 2010. A stakeholder-centric approach to information systems design. *In Proceedings of EChallenges 2010, Uppsala University*. Stockholm: University of Stockholm: 1-8.

SmartSurvey. 2017. Advantages of using Likert scale questions. https://blog.smartsurvey.co.uk/advantages-of-using-likert-scale-questions [22 September 2019].

Sousa, L.d. 2018. Open government and the use of ICT to reduce corruption risks. https://www.ics.ulisboa.pt/books/book3/ch07.pdf [8 June 2019].

South Africa. 2002. South Africa's national research and development strategy. https://www.cepal.org/iyd/noticias/pais/0/31490/Sudafrica_Doc_1.pdf [14 October 2018].

StatisticsSolutions. 2019. Correlation in SPSS. https://www.statisticssolutions.com/correlation-in-spss/ [26 April 2020].

Stephanie. 2016. Kaiser-Meyer-Olkin (KMO) test for sampling adequacy. https://www.statisticshowto.com/kaiser-meyer-olkin/ [2 July 2020].

Stevenson, L. & St-Onge, A. 2011. *Assessment of the environment for the development of women's entrepreneurship in Cameroon, Mali, Nigeria, Rwanda and Senegal*. Geneva: International Labour Office.

Suhr, D.D. 2004. Principal component analysis vs. exploratory factor analysis. *Statistics and Data Analysis,* 203(30):1-11*.*

Suhr, D.D. 2015. Exploratory or confirmatory factor analysis? *Statistics and Data Analysis,* 200(31)1-17*.*

Suresh, L.B. 2011. Impact of information and communication technologies on women empowerment in India. *Systemic, cybernetics and informatics*, 9(4):17-23.

SurveyMethods. 2017. Advantages and disadvantages of survey research. https://surveymethods.com/blog/benefits-and-weaknesses-of-survey-research/ [18 September 2019].

Svoronos, T., Jillson, I.A. & Nsabimana, M.M. 2008. TRACnet's absorption into the Rwandan HIV/AIDS response. *International Journal of Healthcare Technology and Management*, 9(5):430-445, September.

Sweet, J. 2016. Access to Digital Technology Accelerates Global Gender Equality. https://hbr.org/2016/05/access-to-digital-technology-accelerates-global-gender-equality [4 June 2019].

Taarifa. 2019. Rwanda Private Sector Federation receives US$2.26 million to support women entrepreneurs. https://taarifa.rw/2019/05/23/rwanda-private-sector-federation-receives-us2-26-million-to-support-women-entrepreneurs/ [21 June 2019].

Tashobya, A. 2016. Sexual harassment a challenge in service industry. https://www.newtimes.co.rw/section/read/196392 [16 May 2019].

Tatnall, A. & Burgess, S. 2020. Using Actor-Network Theory to research the implementation of a B-B portal for regional SMEs in Melbourne, Australia. *15th Bled electronic commerce conference eReality: Constructing the eEconomy,* Bled, Slovenia, 17-19 June 2002. Slovenia: University of Maribor: 179-191.

Techopedia. 2018. What is a mobile phone? - Definition from Techopedia. https://www.techopedia.com/definition/2955/mobile-phone [18 April 2018].

Thatcher, J.B. & Perrewe, P.L. 2002. An empirical examination of individual traits as antecedents to computer anxiety and computer self-efficacy. *Mis Quarterly*, 26(4):381-396, December.

The Manila Times. 2017. Entrepreneurship: Necessity-driven or opportunity-driven? http://www.manilatimes.net/entrepreneurship-necessity-driven-opportunity-driven/355613/ [8 July 2018].

The New Times. 2013. Rwandans cry foul over high call rates. https://www.newtimes.co.rw/section/read/62787 [18 May 2019].

The New Times. 2016. How PSF has facilitated the growth of women in business. https://www.newtimes.co.rw/section/advertorial/870 [1 July 2019].

The New Times. 2016. Telecoms reignite price wars, slash call rates. https://www.newtimes.co.rw/section/read/196892 [18 May 2019].

The New Times. 2017. Made-in-Rwanda products impress showgoers. https://www.newtimes.co.rw/section/read/224907 [2 June 2019].

The New Times. 2017. New Faces New Voices' Rugori fund timely. https://www.newtimes.co.rw/section/read/208878 [23 May 2019].

The New Times. 2017. Why women entrepreneurs should embrace technological innovations. https://www.newtimes.co.rw/section/read/220159 [1 June 2019].

The New Times. 2019. Sexual harassment has no place in our newsrooms. https://www.newtimes.co.rw/opinions/editorial-sexual-harassment-has-no-place-our-newsrooms [19 May 2019].

The United Nations Conference on Trade and Development. 2014. *Empowering women entrepreneurs through information and communications technologies: A practical guide*. New York: United Nations.

Thong, J. 1999. An integrated model of information systems adoption in small businesses. *Journal of Management Information Systems*, 15(4)187-214, March.

Thong, J.Y.L. & Yap, C.S. 1995. CEO characteristics, organizational characteristics and information technology adoption in small businesses. *Omega*, 23(4):429-442.

Thorn. 2015. *A report on the use of technology to recruit, groom and sell domestic minor sex trafficking victims.* Texas: Thorn.

Thorndike, R. M., Cunningham, G. K., Thorndike, R. K., & Hagen, E.P. 1991. *Measurement and evaluation in psychology and education*. 5th ed. New York: Macmillan.

Timmons, J. 1999. *New venture creation: Entrepreneurship for the 21st Century*. 5th ed. New York: McGraw-Hill.

Todaro, M.P. & Smith, S.C. 2012. *Economic development*. 11th ed. Boston: Pearson

Tornatzky, L., Fleischer, M. & Chakrabarti, A. 1990. *Processes of technological innovation*. Lexington: Lexington books.

Totka, M. 2019. 4 Ways to use the Internet to grow your business. https://www.thebusinesswomanmedia.com/Internet-grow-your-business/ [4 June 2019].

Trade Mark East Africa. 2019. Rwanda Private Sector Federation receives US$2.26 million to support women entrepreneur. https://www.trademarkea.com/news/rwanda-news/rwanda-private-sector-federation-receives-us2-26-million-to-support-women-entrepreneur/ [31 May 2019].

Transparency International. 2018. Corruption perceptions index 2018. https://www.transparency.org/cpi2018 [19 May 2019].

Transparency International. 2018. Report corruption. https://tirwanda.org/ [19 May 2019].

Transparency Rwanda. 2011. *Gender based corruption in workplaces in Rwanda, Kigali*: Transparency Rwanda.

Trochim, W.M. 2006. Descriptive statistics and interpreting statistics. https://socialresearchmethods.net/kb/statdesc.php [1 October 2019].

Trueman, C.N. 2019. Positivism. https://www.historylearningsite.co.uk [3 September 2019].

Tushman, M. & Nadler, D. 1986. Organisation for innovation. *California Management Review*, 28(3):74-94.

Twahirwa, A. 2014. Tech entrepreneur encourages Rwanda's young women to venture into ICT. https://ourworld.unu.edu/en/tech-entrepreneur-encourages-rwandas-young-women-to-venture-into-ict [22 June 2019].

UKEssays. 2018. Research methodology, different types of philosophical. https://www.ukessays.com/essays/psychology/research-methology-is-a-study-which-raises-types-of-philosophical-psychology-essay.php?vref=1 [25 September 2019].

Umutesi, D. 2014. Peace through business: Empowering women entrepreneurs. https://www.newtimes.co.rw/section/read/183000 [14 May 2019].

United States of America.United States Agency for International Development. 2015. Gender analysis for USAID/Rwanda Feed the Future (FtF) Project. https://www.usaid.gov/sites/default/files/documents/1860/GA%20-%20FtF%20-%20FINAL%20December%2014%202015%20-%20Public%20Version.pdf [2 July 2019].

United Nations Development Programme. 2018. Gender inequality index (GII): Human development reports. http://hdr.undp.org/en/content/gender-inequality-index-gii [22 May 2019].

United Nations Office of the High Representative for the Least Developed Countries Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS). 2017. Leveraging investments in broadband for national development: The case of Rwanda and Senegal. http://unohrlls.org/leveraging-investments-in-broadband-for-national-development-the-case-of-rwanda-and-senega [3 April 2020].

United Nations Programme on HIV/AIDS. 2016. *Information and communication technologies: Engaging the private sector and communities in HIV programmes*. Geneva: United Nations Programme on HIV/AIDS.

United Nations. 2016. 17 Sustainable development Goals. https://www.un.org/development/desa/disabilities/envision2030.html [16 May 2020].

United Nations. 2016. Development plans to 2030-UN's sustainable development goals. http://www.fivetalents.org.uk [27 November 2019].

United State of America. National Research Council. 2006. *The importance of telecommunications and telecommunications research*. Washington, DC: The National Academies Press.

United States of America. Central Intelligence. 2019. The world fact book. https://www.cia.gov/library/publications/the-world-factbook/geos/rw.html [11 September 2019].

United States of America. United States Agency for International Development. 2009. *Investing in the Empowerment of women in business*. Kigali: The Business Climate Legal and Institutional Reform Project.

United States of America. United States Agency for International Development. 2016. *USAID East Africa trade and investment hub Rwanda agoa action plan*. Nairobi: United States of America. United States Agency for International Development.

United States of America. United States Agency for International Development. 2009. *Investing in the empowerment of women in Business*. Kigali: The Business Climate Legal and Institutional Reform (BizCLIR) project.

United States of America.United States Agency for International Development. 2015. Gender analysis for USAID/Rwanda feed the future project. https://www.usaid.gov/sites/default/files/documents/1860/GA%20-%20FtF%20-%20FINAL%20December%2014%202015%20-%20Public%20Version.pdf [2 July 2019].

Uwantege, L. & Mbabazi, P. 2015. The impact of women economic empowerment projects on their socio-economic development in Rwanda: The case of agaseke project. *European Journal of Business and Social Sciences*, 4(6):59-87, September.

Vasantha, R. & Harinarayana, N. 2016. Online survey tools: A case study of Google forms. National Conference on" Scientific, computational & information research trends in engineering. University of Mysore, Mysore, 1 January.

Vazquez, E.A. 2011. What is a Women Owned Business? http://www.weconnectinternational.org [19 July 2018].

Venkatesh, V., Morris, M.G., Davis, G.B. & Davis, F.D. 2003. User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3):425-478, September.

Vickery, G., Sakai, K., Lee, I., Sim, H., Faverie, M. 2004. *ICT, E-business and SMEs*. Paris: organisation for economic co-operation and development.

Vis, C. 2012. Educating women entrepreneurs in Kigali, Rwanda. Unpublished master's thesis, University of Amsterdam, Amsterdam.

Voiproutes. 2016. How to reduce your business telephone cost. http://blog.voiproutes.com/how-to-reduce-your-business-telephone-cost [6 June 2019].

Vossenberg, S. 2013. Women entrepreneurship promotion in developing countries: What explains the gender gap in entrepreneurship and how to close it? Maastricht: The Maastricht School of Management.

Walliman, N. 2011. *Research methods: The basics*. New York: Routledge.

Waters, D. 1994. *Quantitative methods for business*. Wokingham: Addison-Wesley.

Weber, D.M. & Kauffman, R.J. 2011. What drives global ICT adoption? Analysis and research directions. *Electronic commerce research and applications*, 10(6):683-701, November.

Weibell, C.J. 2011. Principles of learning: 7 principles to guide personalized, student-centered learning in the technology-enhanced, blended learning environment. https://principlesoflearning.wordpress.com [13 July 2018].

Welsh, J. A. & White, J. 1981. A small business is not a little big business. *Harvard Business Review*, 59(4):18-32, July-August.

Werber, B., Rajkovič, U., Urh, M. & Žnidaršič, A. 2015. Computer literacy and use of ICT as key factors of micro-enterprise success. *Economics and Management*, 18(2):165-182, June.

Westbrook, K. 2018. Business competition: How connecting with competitors is actually good for business. https://www.business2community.com/small-business/business-competition-how-connecting-with-competitors-is-actually-good-for-business-02056300 [27 June 2019].

Whittle, A. & Spicer, A. 2008. Is actor network theory critique? *Organization studies*, 29(4):611-629, April.

Wikipedia. 2019. *Electrical grid*. https://en.wikipedia.org/wiki/Electrical_grid [24 June 2019].

Wikipedia. 2019. Gasabo district. https://en.wikipedia.org/wiki/Gasabo_District [8 October 2019].

Wikipedia. 2019. *Google forms*. https://en.wikipedia.org/wiki/Google_Forms [22 September 2019].

Williams, C. 2007. Research Methods. *Journal of Business & Economic Research*, 5(3):65-72, March.

Wisconsin-Milwaukee, U. O. 2018. National research center for distance education and technological advancements. http://uwm.edu/deta/ [14 April 2018].

Wisedom. 2018. Collection of secondary data - research methodology. https://www.wisdomjobs.com/e-university/research-methodology-tutorial-355/collection-of-secondary-data-11494.html [29 September 2019].

Wolf, K. & Frese, M. 2018. Why husbands matter: Review of spousal influence on women entrepreneurship in sub-Saharan Africa. *Africa Journal of Management*, 4(1):1-32, January.

World Bank. 2016. Preventing violence against women in transport systems. http://www.worldbank.org/en/news/feature/2016/03/08/preventing-violence-against-women-in-transport-systems [11 June 2019].

World Bank. 2019. *Doing business*. Washington, DC: World Bank.

World Bank. 2019. Ease of doing business rankings. https://www.doingbusiness.org/en/rankings?region=sub-saharan-africa [14 November 2019].

World Economic Forum. 2012. Global Gender Gap Report 2012. http://www3.weforum.org/docs/WEF_GenderGap_Report_2012.pdf [15 May 2020].

World Health Organization. 2017. HIV/AIDS. https://www.who.int/features/qa/71/en/ [20 May 2019].

World Wide Web Foundation. 2016. Women's Rights Online Digital Gender Gap Audit. https://webfoundation.org/research/digital-gender-gap-audit/ [24 May 2018].

Wright, M. 2018. How pilot testing can dramatically improve your user research. https://www.widerfunnel.com/pilot-testing-user-research/ [23 September 2019].

Writer, G. 2018. How Amazon and entrepreneurs can pay zero federal income tax, and do so legally. https://www.entrepreneur.com/article/313331 [6 June 2019].

Yunus, M. 2003. *Banker to the Poor Micro-Lending and the Battle Against World Poverty*. New York: PublicAffairs Books.

Yunus, M., Moingeon, B. & Lehmann-Ortega, L. 2010. Building social business models: Lessons from the Grameen experience. *Long range planning,* 43(2-3): 308 - 325, April 1.

Yusuf, A. A. 2013. Impact of ICT on SMEs in Africa. Unpublished Bachelor´s thesis. Turku University of applied sciences, Turku.

Zahid, M., Ashraf, M., Malik, B. & Hoque, M. 2013*. Information communication technology (ICT) for disabled persons in Bangladesh: Preliminary study of impact/outcome*. Berlin: Springer.

APPENDIX A: QUESTIONNAIRE

Section 1: Sociodemographic information

1. Are you married? Urashatse?

Yes yego	
No oya	

2. If yes, please indicate your marital status niba ari yego, ni muruhe rwego

Married ndubatse	
Separated natandukanye numugabo bitari mumategeko	
Divorced natandukanye numugabo mumategeko	
Widowed umupfakazi	

3. How old are you as at your last birthday? _____ (years) ufite imyaka ingahe

4. What is your level of education? [Please tick the one that applies to you] wize amashuli angina iki? Shyira akamenyetso kumusaraba kugisubizo kimwe gikwiye

No formal education ntabwo nize amashuli asanzwe	
Primary school amashuli abanza	
Vocational training amashuli yimyuga	
Secondary school amashuli yisumbuye	
National diploma ikiciro cyambere cya kaminuza	
Bachelor's degree ikiciro cya kabili cya kaminiza	
Master's degree ikiciro cya gatatu cya kaminuza	
Doctorate degree ikiciro cya kane cya kaminuza	

5. What is your nationality? Nubuhe bwenegihugu bwawe?

Rwandan Umunyarwanda	
Foreigner Umunyamahanga	

6. Are you a member of the Rwanda Chamber of Women Entrepreneurs?

yes yego	
No oya	

7. What did you do before you started a business? Please tick one box wakoraga iki mbere yo gutangira ubucuruzi? Shyira akamenyetso kugisubizo kimwe

I was doing the same business for an employer nakoraga ubucuruzi nkubu numukoresha	
I was working for a private company nakoraga muri sosiyete yigenga	
I was working for the government nakoreraga leta	
I did not have a job ntakazi narimfite	

I was a student nari umunyeshuli	
I was a domestic worker nari umukozi wo murugo(umuboyi)	
Other (please identify) undi murimo wakoraga ntavuze haruguru	

Section 2: Business Knowledge/Skills Ubumenyi mubucuruzi

8. Did you have an opportunity to participate in learning business courses/ modules before you launch your business? Please tick one box. Wagize amahirwe yo kwiga amasomo yubucuruzi mbere yuko utangira gucuruza? Shira akamenyetso kugisubizo kimwe.

Yes Yego	
No oya	

9. Did you attend an entrepreneurship training before you launched your business? If the answer is yes, please answer question 10 and 11. However if your answer is no, please skip question 10 and 11. Waba waragize amahugurwa ya rwiyemezamirimo mbere yuko utangira ubucuruzi? Niba ari yego, subiza ikibazo cya 10 na 11. Niba ari oya, taruka ikibazo cya 10 nicya 11

Yes	
No	

10. If yes to question 9, who was your training organiser? Please tick one or more than one. Niba ari yego kukibazo cya 9, ninde wari wateguye ayo mahugurwa? Shyira akamenyetso kugisubizo kimwe cyangwa byinshi.

Chamber of women entrepreneurs urugaga rwabagore ba rwiyemeza mirimo	
Private Sector Federation urugaga rwabikorera kugiti cyabo	
Goldman Sachs 10 000	
Women for women	
Peace Through Business (PTB)	
Business Professionals Network (BPN)	
Other, please specify. Abandi ntavuze haruguru	

11. If you attended training (Question 9). How did it help you in doing better business? Please tick all that apply. Niba warabonye amahugurwa (ikibazo cya 9) byagufashije gute gukora ubucuruzi neza

Bookkeeping kuzuza neza ibitabo byubucuruzi	
Entrepreneurship skills ubumenyi mu bya rwiyemezamirimo	
Financial management gucunga umutungo	
Improve my ICT skills byanyongereye ubumenyi mwikoranabuhanga	
Marketing skills ubumenyi mubyamasoko	
Networks relationship umubano mwiza nabafatanyabikorwa	
Personnel management gucunga abakozi	
Time management gukoresha neza igihe	
Nothing, it did not help ntacyo byamariye	
Other, please specify vuga ibindi bitari kurutonde hejuru	

Section 3: Business Profile Umwirondoro wa business

12. How many businesses do you have? _____ (Indicate number, e.g. 2, 3, 4 etc). Ufite business zingahe? Andika umubare urugero, 2, 3, 4)

13. What is the legal category of your business? Please tick one box. Ubucuruzi bwawe buri mukihe kiciro cyamategeko? Hitamo igisubizo kimwe

Sole proprietorship Ubucuruzi nubwanjye	
Limited by shares mfatanyije nabandi, mfitemo imigabane	
Limited by guarantee bushingiye kungwate	
Limited by shares and by guarantee mfatanyije nabandi, mfitemo imigabane kandi bushingiye kungwate	
Unlimited business irigenga ntishamikiye kumutungo wanyirayo	

14. Which industry does your business operate in? You can tick more than one Ubucuruzi bwawe bukora mukihe kiciro? Ushobora gusubiza byinshi

Agriculture Ubuhinzi	
Construction Ubwubatsi	
Exportation kohereza ibintu mumahanda	
ICT ikiranabuhanga	
Importation gutumiza ibintu mumahanga	
Manufacturing uruganda	
Retail ubucuruzi bwubuconsho	
Services gutanga services	
Transportation ubwikorezi	
Wholesale kuranguza	
Other, please specify ahandi ntavuze haruguru	

15. If your business provides a service, please answer question 15. You can tick more options if you are involved in more than one service if your business does not provide a service, do not answer question 15. Niba ubucuruzi bwawe butanga service, subiza ikibazo cya 15. Ushobora guhitamo ibisubizo birenze kimwe ukurikije service utanga. Niba udatanga service, simbuka ikibazo cya 15.

Accommodation (e.g. lodges, letting the house or flat, etc.) Gukodesha amazu, amacumbi	
Cleaning Gukora isuku	
Clothing (e.g. sewing, buying & selling) kudoda, kugura no gucuruza imyenda	
Entertainment (e.g. tourism, event organisation**)** Imyidagaduro, ubukerarugendo, gutegura iminsi mikuru	
Food (e.g. restaurant) Gucuruza ibiribwa. urugero restaurant	
Hairdresser (salon)) Gutunganya imisatsi (salon de coiffure)	
Handicrafts (all those made manually not using the machine) Imitako ikozwe nintoki, kuboha	
Hardware ubucuruzi bwibikoresh byubwubatsi namashanyarazi	
Exportation Kohereza ibintu mumahanga	
Importation gutumiza ibintu mumahanga	

Professional (e.g. Legal, Medicine, Information technology, Accounting, etc.) Umunyamwuga(Avocat, muganga, ikoranabuhanga, comptable)	
Transport Ubwikorezi	
Other, specify izindi nservices zitavuzwe hejuru	

16. How long has your business be in operation? _____years
Umaze igihe kingana iki mubucuruzi? ---------- Imyaka

17. What is the primary source of money you used to start your business? You can choose more than one options. Nihe wakuye igishoro cyo gutangira ubucuruzi? Ushobora gusubiza ibisubizo birenze kimwe

Bank banki	
Church itorero	
Family umuryango	
Friends inshuti	
Government leta	
Husband umugabo	
microfinance ikigega giciriritse	
My savings narizigamiye	
Non- governmental organisation(NGO) imiryango itegamiye kuri leta	
Pension ubwiteganyirize bwabakozi	
Other, please specify ahandi hatari kurutonde hejuru	

18. How much capital did you use to start your business? Please tick one box
Watangije igishoro kingana iki? shyira akamenyetso kugisubizo kimwe

Less RwF 500 000	
RwF 500 000 - 15 500 000	
RwF 15 000 000 – 75 000 000	
More than 75 000 000	

19. How many workers do you have including the owner (s)? _____
Ufite abakozi bangahe nawe urimo? ----------

20. What is your approximate annual income? Please tick one box. Ugereranyije ucuruza amafranga angahe hamwe mumwaka? Shyira akamenyetso kugisubizo kimwe

Less RwF 300 000	
RwF 300 000 – 12 000 000	
RwF 12 000 000 – 50 000 0000	
More than 50 000 000	

21. How did you start the business? Please tick one box. Watangiye ubucuruzi gute? Shyira akamenyetso kugisubizo kimwe

On scratch Natangiriye kuri zero	
As a family business ubucuruzi bwumuryango	
It was my owner initiative cyari igitekerezo cyange bwite	

Bought out existing business naguze business yari ituwe ikora	
business succession narazunguye	
Franchise nafunguye ishami rya business ituwe ikora	
Other, please identify ukundi watangiye business kutari kurutonde hejuru	

22. Where is your business registered? Please tick one box.

Minicipality Umurenge	
District akarere	
Rwanda Cooperative Agency (RCA) mumakoperative	
Private sector Federation (PSF) urugaga rwabikorera kugiti cyabo	
Rwanda Development Board (RDB)	
Social Security Board (RSSB)	
Rwanda Revenue Authority (RRA)	
Other, please identify ahandi hatari kurutonde hejuru	

23. What are your preferred consumers? Please tick one box ni abahe bakugurira. Hatamo bamwe wuzuza mukazu hasi

City of Kigali (Kigali habitant) abaturage batuye muri Kigali	
National (consumers from other provinces outside of Kigali abaturage batuye hanze ya Kigali	
Foreign (consumers from outside the country such as tourists) abanyamahanga nka ba mukerarugendo	

24. Do you have shareholders? Please tick one box.
Ufatanyije nabandi? Shyira akamenyetso kugisubizo kimwe

Yes yego	
No oya	

25. If yes to question 24 how many? If no, please skip to question 25. Niba ari yego niba ari yego kukibazo cya 24, subiza ikibazo cya 25. Niba aro oya, taruka ikibazo cya 25

Women (write number) abagore (andika umubare)	
Men (write number)) abagabo (andika umubare)	
How many shares do you have in business (write a percentage %) Ufite imigabane ingahe muri business? (Andika %)	

26. What is the current status of your business? Please chose one response. Ubucuruzi bwawe buhagaze gute muri iki gihe? Hitamo igisubizo kimwe

Growing burakura		Stagnating buhagaze hamwe		Not growing ntibukura	

27. If your business is growing, which areas it is growing in? More options are possible. Niba ubucuruzi bwawe bukura, buri gukura mukihe kiciro? Ibisubizo byinshi birashoboka

An increasing number of employees Umubare wabakozi uriyongera	
Increasing sales urugero rwibyo nshuruza ruriyongera	
Increasing incomes amafaranga nshuruza ariyongera	
increasing benefits inyungu iriyongera	

Increasing range of products umubare wibicuruzwa uriyongera	
Extended services services ntanga ziriyongera	
Extended markets isoko riraguka	
Extended on the international market isoko ryaragutse kurwego mpuzamahanga	
Other, please specify ahandi ubucuruzi bwawe bukura bitavuzwe haruguru kurutonde	

28. If your business is not growing, why is it not growing? More options are possible. Niba ubucuruzi bwawe budakura, nukubera iki? Ibisubizo byinshi birashoboka.

More competitors Abacuruzi benshi ducuruza bimwe	
Small working capital Igishoro gito	
No access to loans ntabwo nshobora kubona umwenda	
More taxes paid ntanga imisoro myinshi	
Few consumers abaguzi bake	
Consumers do not like to support women businesses Abaguzi ntibakunda kugurira abagore	
I use more money in the family nkoresha amafranga menshi mumuryango	
Expensive rent ubukode burahenze	
High communication prices igiciro kitumanaho kiri hejuru	
High-interest rates paid narishye inyungu nyinshi kumwenda	
Other, please specify izindi mpamve zituma ubucuruzi bwawe budakura bitari kurutonde hejuru	

29. Among the following statement, which one describes the performance of your business?

Please tick one box Muri izi ngingo zo hasi, niyihe isobanura isobanura uko ubucuruzi

Performing very well burakora neza cyane	
Performing fairly burakora neza	
Neutral burakora murugero	
Performing poorly burakora bucye	
Not performing ntakigenda	

30. What changes did the business bring to you? You can tick more than one option. Niki ubucuruzi bwahinduye mubuzima bwawe? Ushobora gusubiza ibisubizo birenze kimwe

Build a house nubatse inzu	
Buy a car naguze imodoka	
Education fees for my family narishye amafaranga yishuri yumuryango wanjye	
Mutual Health insurance for my family naguze mutuelle de sante yumuryango wanjye	
Respect in family and community impesha icyubahiro mumuryango naho ntuye	
Recreation and leisure time Kwidagadura nikiruhuko	

Improved lifestyle yateje imbere imibereho	
Other specify ibindi business yakugejejeho bitavuzwe hejuru kurutonde	

31. When you started your business, did you draw up a written business plan? Please tick one box. Igihe watangiraga ubucuruzi, wari ufite business plan yanditse? Shyira akamenyetso kugisubizo kimwe

Yes yego	
No oya	

Section 4: Reasons for starting a business impamvu yaguteye gutangira ubucuruzi

This section responds the first research question "What is the motivation for women-owned enterprises in Kigali, Rwanda to start a business?" iki kiciro kirasubiza ikibazo cyambere cyubushakashatsi" Niyihe mpamvu itera abagore gutangira ubucuruzi Ikigali mu Rwanda?

32. What was the main reason you started your business? Please tick one option..

Unemployment ntakazi narimfite	
Maltreatment where I worked aho nakoraga bamfataga nabi	
Job dissatisfactions sinari nishimiye akazi nakoraga	
Divorce or separation gutandukana nuwo twashakanye	
Death of husband urupfu rwumugabo wanjye	
Unwanted pregnancy Gusama ntabishaka	
Refugee ubuhunzi	
Independence ubwigenge	
Fulfilment my entrepreneur intention inyota yo kuba rwiyemezamirimo	
Self-actualisation kwiteza imbere	
Innovation guhanga agashya	
I spotted an opportunity nabonye amahirwe nabyaza umusaruro	
I needed time to care for my family while generating income nashakaga igihe cyo kwita kumuryango kandi nkinjiza imali	
I am not educated to find a job in the labour market ntabwo nize ngo nshake akazi kwisoko ry'umurimo	
My contract with my employer terminated Amasezerano yakazi numukoresha wanjye yari yarangiye	
Support government and stakeholders give women entrepreneurs inkunga leta nabafatanyabikorwa baha ba rwiyemezamilimo babagore	
I needed to generate more revenue nashakaga kwinjiza amafaranga menshi	
Education, training and experience amashuli nize, amahugurwa nuburambe mukazi	
Challenge men by showing them that women can also start and run a successful business Kwereka abagabo ko numugore ashobora gucuruza bikagenda	
Other, please specify izindi mpamvu zitari kurutonde hejuru	

33. Did you ask for permission from your husband or family to start a business? Please tick one box. Wasabye uruhushya umugabo cyangwa umurwango rwo gutangira ubucuruzi? Shyira akamenyetso kugisubizo kimwe.

Yes I did and my husband was supportive yego nararusabye kandi umugabo yarashyigikiye	
Yes I did but my husband was not supportive yego nararusabye ariko umugabo ntiyanshyikiye	
No I did not oya ntarwo nasabye	
It was my husband proposition cyari ikifuzo cyumugabo wanjye	
No husband, I made the decision myself (widow) ndumupfakazi, nafashe ikemezo kubwanjye	
Yes I asked for permission from my family and they were supportive (single) Yego, ndi ingaragu. narusabye umuryango kandi baranshyigikiye	
Yes, I asked for permission from my family but they were supportive (single) Yego. Ndi ingaragu. nararusabye ariko umuryango ntiwanshyigikiye	
No, I did not ask for permission from my family (single) Oya, ndi ingaragu. ntabwo nasabye umuryango	

Section 5: Constraints face women-owned small and medium enterprises in Kigali, Rwanda. Ibibazo abagore bafite ubucuruzi buto nubuciriritse bahura nabyo I Kigali, Rwanda

This section tends to answer second research question “What are the constraints experiencing women entrepreneurs in running small and medium businesses in Kigali, Rwanda”? Please select one option for each statement. Strongly agree 5; strongly disagree 1. Iki gice kirasubiza ikibazo cya kabili cyubushakashatsi”Ni ibihe bibazo (imbogamizi) abagore ba rwiyemezamirimo bahura nabyo mubucuruzi buto nubuciriritse I Kigali”? Hitamo igisubizo kimwe kuri buli kibazo. Ndabyemera cyane 5; ndabihakanye cyane 1

	Statement	Strong ly disagree ndabihakanye cyane	Disagree	Neutral ndfashe,	Agree ndabyemera	Strongly cyane Agree
34 - 39	**Gender inequality: ubusumbane mubitsina**	1	2	3	4	5
34	There is gender inequality in business Hari ubusunmbane bushingiye kugitsina					
35	Being a woman is a negative factor in business Kuba umugore bigira ingaruka mbi kubucuruzi	1	2	3	4	5
36	Customs and local culture disadvantage women to operate a business Imiziro numuco bidindiza abagore gukora ubucuruzi	1	2	3	4	5

37	It is difficult for women to access finance Biragoye ko umugore abona umwenda	1	2	3	4	5
38	Inability to travel because of family/ husband obligations Kuba umugore adashobora gukora ingendo kubera umuryango / amabwiriza yumugabo nimbogamizi kubucuruzi	1	2	3	4	5
39	Sexual harassment is a constraint Ihohoterwa rishingiye kugitsina nikibazo	1	2	3	4	5
40 - 42	**Financial constaints: Imbogamizi zimali**	1	2	3	4	5
40	High-interest rates is a constraint Inyungu ihanitse nimbogamizi					
41	Short term to pay back the loan is a constraint Kuriha umwenda mugihe gito nimbogamizi	1	2	3	4	5
42	Collateral to obtain a loan is a constraint Ingwate kugira ngo ubone umwenda nimbogamizi	1	2	3	4	5
43 - 52	**Government constraints imbogamizi za leta**	1	2	3	4	5
43	Lack of a support network is a constraint Kutagira ubufasha bwabafatanyabikorwa nimbogamizi					
44	Access to government service is a constraint Kubona servise za leta nikibazo	1	2	3	4	5
45	Business registration is a constraint Kwandikisha ubucuruzi nikibazo	1	2	3	4	5
46	High taxes is a constraint Imisoro ihanitse nimbogamizi	1	2	3	4	5
47	Lack of market opportunities is a constraint Kubura amasoko nimbogamizi	1	2	3	4	5
48	A bribe of government officials is a constraint Ruswa mubakozi ba leta nimbogamizi	1	2	3	4	5
49	Inability to obtain public tender is a constraint Kutabasha kubona amasoko ya leta nimbogamizi	1	2	3	4	5
50	High transport cost is a constraint Igiciro gihanitse kingendo nubwikorezi nimbogamizi	1	2	3	4	5
51	High communication cost is a constraint Igiciro gihanitse kitumanaho nimbogamizi	1	2	3	4	5
52	Lack of incubator centre is a constraint Kubura ibigo ngishwanama nimbogamizi	1	2	3	4	5
53 - 57	**Skills constraints: Imbogamizi zubumenyi**	1	2	3	4	5
53	Lack of education and training is a constraint Kuba ntamashuli namahugurwa nimbogamizi					
54	Lack of entrepreneurial skills is a constraint Kubura ubumenyi mubya rwiyemezamirimo nimbogamizi	1	2	3	4	5
55	Lack of management skills is a constraint Kubura ubumenyi mugucunga umutungo nimbogamizi	1	2	3	4	5

56	Lack of business experience is a constraint Kubura uburambe mubucuruzi nimbogamizi	1	2	3	4	5
57	Lack of information technology skills (e.g. Internet) is a constraint kubura ubumenyi mwikoranabuhanga nka Internet nimbogamizi	1	2	3	4	5
58 - 59	**Own fear Ubwoba**	1	2	3	4	5
58	HIV/AIDS is a constraint Sida nimbogamizi					
59	Fear of failure is a constraint Ubwoba bwo guhomba nimbogamizi	1	2	3	4	5

Section 6: The contribution of ICT to improve women businesses and find a solution to constraints they face in doing business in Kigali. . Uruhare rwikoranabuhanga muguteza imbere ubucuruzi bwabagore no gukemura imbogamizi bahura nazo mubucuruzi I Kigali.

This section responds third research question “How could information and communication technology intervene to find solutions to constraints facing women entrepreneurs in doing business in Kigali, Rwanda”? Iki gice kirasubiza ikibazo cya gatatu cyubushakashatsi ”Nigute ikoranabuhanga ryakwifashishwa mugushaka ibisubizo byimbogamizi abagore bahure nabyo mubucuruzi ikigali mu Rwanda”?

60. Do you own some of the devices enumerated below (more options are possible)? Ufite bimwe muri ibi bikoresho biri kurutonde hasi? (Ushobora gutanga ibisubizo birenze kimwe)

Cellphone	
Computer	
Laptop	
Tablet	
Radio	
Television	
Fax machine	

61. Do you have access to the Internet? If no please skip to question 62. Please tick one box Ushobora kujya kuri Internet? Niba oya simbuka ikibazo cya 63. Hitamo igisubizo kimwe

Yes	
No	

62. If yes to question 61 how do you access the Internet (tick all that apply)? Niba ari yego kukibazo cya 61 nigute ujya kuri Internet. Subiza uburyo bwose ukoresha

Cellphone	
Computer	
Tablet	
Laptop	

63. Where do you access the Internet? You can tick more than one option
Ni hehe ujya kuri Internet? Ushobora gutanga ibisubizo birenze kimwe

At home murugo	
At a friend's home murugo rwinshuti	
At work/office kukazi/mubiro	
At a friend's work/office kukazi kinshuti/ibiro	
At an Internet café	
At a public library Isomero rusange	
At a entrepreneurship club ihuriro rya ba rwiyemezamirimo	
other, please specify ahandi havuge	

How do you use the following devices in your business?
Please select one option for each device. Always 5; never 1

	Device	**Never Ntabyo nkoresha**	**Rarely Gake**	**Sometimes Rimwe narimwe**	**Very often Hafi burigihe**	**Always Burigihe**
64	Cellphone	1	2	3	4	5
65	Computer	1	2	3	4	5
66	Laptop	1	2	3	4	5
67	Tablet	1	2	3	4	5
68	Internet café	1	2	3	4	5
69	Radio	1	2	3	4	5
70	Television	1	2	3	4	5
71	Fax machine	1	2	3	4	5

72. How do you rate the utilisation of ICT (e.g. Cellphone, Internet) in your business?
Please select one option for each statement below. Very important 5; Useless 1
Ni kuruhe rugero uha ikoranabuhanga nka Internet, cellphone mubucuruzi bwawe?

Very important Ingirakamaro cyane	5
Important ingirakamaro	4
Neutral ndifashe, hagati	3
Less important akamaro gake	2
Useless ntamumaro	1

73. Please rate the following statement to indicate your agreement-ICT instruments can be used to increase business performance and growth. Please select one option for each statement below. Strong agree 5; strong disagree 1. Ni uruhe rugero wemeranyaho niyi ngingo" Ibikoresho byikoranabuhanga bishobora gukoreshwa mubucuruzi bikongera imikorere myiza ndetse ubucuruzi bugakura. Tanga igisubizo kimwe.

Strongly agree ndabyemera cyane	5
Agree ndabyemera	4
Neutral ndifashe, hagati	3

Disagree ndabihakanye	2
Strongly disagree ndabihakanye cyane	1

74. The following statement describes your competency in using a computer. Please select one option for statement below. Ingingo ikurikira irasobanura ubushobozi ufite mugukoresha mudasobwa. Hitamo igisubizo kimwe.

1	Unfamiliar Sinyimenyereye	I do not have the skills to use computer technology Ntabumenyi mfite mugukoresha mudasobwa
2	Newcomer Ndimushya	I do have little skills to use a computer; I am struggling and need help to use technology. Mfite ubumenyi buke mugukoresha mudasobwa. Ndahuzagurika, nheneye ubufasha mugukaresha ikoranabuhanga
3	beginner Umutangizi	I have basic skills to use some application Mfite ubumenyi bwibanze mugukoresha programu zimwe na zimwe
4	Average Murugero	I can use some computer applications Nshobora gukoresha programu zimwe nazimwe
5	Advanced Ndabisobanukiwe	I can use adequately more computer application Nshobora gukoresha neza zimwe muri programu za mudasobwa
6	Expert Impuguke	I am specialist in computer programmes Ndi impuguke muri programme za mudasobwa

75. Please indicate activities you can perform on the computer (more option are possible). Erekana ibyo ushobora gukora kuri mudasobwa. Ushobora gutanga ibubizo birenze kimwe.

Bookkeeping (accounting, stock taking etc.) Kuzuza ibitabo byubucuruzi (comptabilite, stock)	
Sending and receiving money kohereza no kwakira amafranga	
Buying products/services (e.g. Stock) online using the Internet Kugura ibintu cg services (urugero ibicuruzwa) ukoresheje Internet	
Selling products/services online using the Internet kugurisha ibintu cg service kuri Internet	
Sending and receiving emails kohereza cg kwakira amabaruwa kuri Internet	
Importation online using the Internet Gutumiza ibintu mumahanga ukoresheje Internet	
Exportation online using the Internet Kohereza ibintu mumahanga ukoresheje Internet	
Track freights online using the Internet Kureba aho ibicuruzwa bigeze ukoresheje Internet	
Conference video using the Internet gukora inama kuri video ukoresheje Internet	
Learning and training online using the Internet Kwiga no kwihugura ukoresheje Internet	
Advertising product/service on socio-media Kwamamaza ibicuruzwa/serisi kumbuga nkoranyambaga	
the searching market of your product/services Gushaka isoko ryibicuruzwa/servisi byawe	

Exchange with networks via social media (e.g. Facebook, histogram, WhatsApp) kuganira nabafatanyabikorwa ukoresheje imbuga nkoranyambaga nka facebook, Histograna WhatsApp.	

The following statements regarding utilisation of Internet and cellphone in business. Please tick one box to each statement below. Ingingo ikurikira irarebana nikoreshwa

	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
76	I search for information on the Internet on how a woman can achieve success in business. Nshakisha amakuru kuri Internet uko umugore ashobora kugera kubucuruzi bushinze imizi kandi bwunguka.	1	2	3	4	5
77 - 101	**Online access**					
77	I use the Internet to search how I can cope with beliefs and cultural challenge women entrepreneurs Nkoresha interet nshaka uko nahangana nibyiyumviro numuco bibongamira abagore ba rwiyemezamilimo	1	2	3	4	5
78	I search for information on the Internet on how I can access to finance such as finding loans on good deals. Nshakisha amakuru kuri Internet yuko nabona amafranga	1	2	3	4	5
79	I search for information on the Internet on where I can access finance for instance find a loan on a good deal. Nshakisha amakuru kuri Internet yaho nabona amafranga	1	2	3	4	5
80	I search for information on the Internet where I can get a loans with lower interest rates. Nshakisha amakuru kuri Internet yahoo nakura umwenda kunyungu nkeya	1	2	3	4	5
81	I search for information on the Internet on how to apply successful a loan. Nshakisha amakuru kuri Internet yuko usaba umwenda ukawubona.	1	2	3	4	5
82	I search for information on the Internet on where I can obtain loans that do not demand guarantee. Nshakisha amakuru kuri Internet yaho nshobora kubona umwenga batansabye ingwate.	1	2	3	4	5
83	I search networks on the Internet to find who I can collaborate with to improve my business. Nshakisha kuri Internet abafatanyabikorwa bashobora kumfasha guteza imbere ubucuruzi bwanjye.	1	2	3	4	5

84	I use the Internet to access government services. Nkoresha Internet mukugera kuri serivisi za leta	1	2	3	4	5
85	I registered my business online. Nandikishije ubucurzi bwanjye nkoresheje Internet	1	2	3	4	5
86	I search for information on the Internet on how to run a legal business and pay low taxes. Nshakisha amakuru kuri Internet yuko nshobora gucuruza nkurikije amategeko kandi nkasora imisoro mike.	1	2	3	4	5
87	I use the Internet to learn how business works. Nkoresha Internet mukwiga uko ubucuruzi(business) bukora	1	2	3	4	5
88	I use the Internet to learn how I can manage the business and make it succeed. Nkoresha Internet mukwiga uko nshunga business kandi ikanatera imbere	1	2	3	4	5
89	I search new online markets to find where I can sell my products or services. Nshakisha kuri Internet amasoko mashya nshobora gucuruzamo ibicuruzwa byanjye na servisi.	1	2	3	4	5
90	I advertise my products or services online or on social media. Namamaza ibicuruzwa/serivisi byanjye kuri Internet/ imbuga nkoranyambaga	1	2	3	4	5
91	I communicate with my networks via email to limit travel to meet face to face. Mvugana nabafatanyabikorwa mbandikiye (email) nkoresheje Internet murwego rwo kugabanya ingendo njya kubonana nabo amaso kumaso	1	2	3	4	5
92	I discuss business on a cellphone with my networks instead to travel to meet them. Mvugana kuri cellphone ibyubucuruzi nabafatanyabikorwa aho kujya guhura nabo	1	2	3	4	5
93	I order my stock online Ndangura ibicuruzwa nkoresheje Internet	1	2	3	4	5
94	I order my stock via cell phone Ndangura ibicuruzwa nkoresheje cellphone	1	2	3	4	5
95	I search for information on the Internet regarding right against sexual abuse Nshakisha amakuru kuri Internet arebana nuburenganzira bwo kurwanya ihohotera rishingiye kugitsina	1	2	3	4	5
96	I search for information on the Internet regarding public health Nshakisha amakuru kuri Internet arebana nubuzima	1	2	3	4	5
97	I search for information on the Internet regarding HIV/AIDS Nshakisha amakuru kuri Internet arebana na Sida	1	2	3	4	5

98	I search for information on the Internet regarding my right and punishment for giving and receiving a bribe Nshakisha amakuru kuri Internet arebana nuburenganzira bwanjye ndetse nibihano kukwakira no gutanga ruswa .	1	2	3	4	5
99	I search for information on the Internet regarding public tender and how to compete within the markets Nshakisha amakuru kuri Internet arebana namasoko ya leta nuko apiganirwa	1	2	3	4	5
100	I search for information on the Internet on how to limit the transport cost. Nshakisha amakuru kuri Internet yuko nagabanya ikiguzi kingendo nubwikorezi	1	2	3	4	5
101	I search for information on the Internet on how to limit the communication cost. Nshakisha amakuru kuri Internet yuko nagabanya ikiguzi cyitumanaho	1	2	3	4	5

102. Where do you obtain the most useful news, information, and counsel for your business? Please select one option. Nihehe hibanze ukura amakuru yingirakamaro ninama birebana na business yawe? Hitamo igisubizo kimwe.

Chamber of women entrepreneurs Urugaga rwa ba rwiyemezamirimo babagore	
Cellphone	
Government publication Ibinyamakuru bya leta	
Internet on a cellphone Internet kuri cellphone	
Internet on laptop	
Newspaper Ibinyamakuru	
Private sector federation Urugaga rwabikorera kugiti cyabo	
Radio	
Television	
Word of mouth abantu bavuga	
Other (please identify). Ahandi	

If you did any of the activities below within the last 12 months, please indicate which communication channel you use to carry out activities. Please select one response to each statement. Niba hari igikorwa muribi byanditse hasi wakoze mumezi 12 ashize, nuwuhe muyoboro witumanaho wakoresheje urangura icyo gikorwa? Hitamo igisubizo kimwe kuri buri kibazo.

	Statement	**Internet on computer**	**Internet on a cellphone**	**SMS**	**Calls**
103	Receiving information regarding products/services. Kwakira amakuru arebana nubicuruzwa/services				

104	Obtaining information about health; nutrition, diseases, public health. Nabonye amakuru arebana nubuzima, imirire myiza, indwara ndetse nubuzima bwa rubanda				
105	Communicate with the government, download form, complete form online, pay online, and register business, RRA. Kuvugana na leta, gufotora amafishi, kuzuza amafishi kuri Internet no kwishyurrira kuri Internet				
106	Send and receive emails. Kohereza no kwakira u butumwa				
107	Using Internet, Skype, WhatsApp etc. Gukoresha Internet, Skype, WhatsApp, nibindi				
108	Buying products/ services. Kugura ibicuruzwa/serivisi				
109	Demand information to suppliers. Gusaba amakuru aho ndangura				
110	Selling products/services. Kugurisha ibicuruzwa/serivisi				
111	Consumers demand information. Abaguzi bambaza amakuru				
112	Sending/ receiving/ paying money. Koherza/kwakira no kwishyura amafaranga				
113	Short training/ tertiary education. Amahugurwa magufi/ Kaminuza				
114	Using social media. Gukoresha imbuga nkoranyambaga				
115	Findings new consumers. kubona abaguzi bashya				
116	Finding suppliers Kubona aho kurangura				
117	Communicate with business networks/ association/ group chart. Kuvugana nabafatanyabikorwa, amashyirahamwe namatsinda(group chart)				
118	Comply with government requirements such as registering business online, paying taxes online, apply the licence. kuzuza ibisabwa na leta nko kwandikisha ubucuruzi kuri Internet, kwishyura				

	imisore ukoresheje intenet no gusaba ipantanti/licence				
119	Obtaining information that can help me make decisions in my business. Kubona amakuru ashobora kumvasha gufata ikemezo mubucuruzi bwanjye				
120	Doing market research Gukora ubushakashatsi bwisoko				
121	Daily filling business books using software for, eg. Stocktaking, accounting, employee's management. Kuzuza ibitabo burimunsi hakoreshejwe programu nkiya stock, comptabilite, gucunga abakozi.				
122	Advertising my product and services. Kwamamaza ibicuruzwa/serivisi				
123	Obtaining business support services (incubation centre; advices, business development, etc,). Kubona ubufasha mubucuruzi bwibigo bikurikirana imishinga, inama, nabakangurambaga mubyo gukura kwa business				

SMS: Short Message Service

On the list below, what information do you judge important to your business and you do not obtain. Please select one option for each statement below. Kuri runo rutonde hasi, ni ayahe makuru ubona yingenzimubucuruzi bwawe kandi utabona. Hitamo igisubizo kimwe kuri buri kibazo

	Statement	**I need access to this information Ndashaka kugera kuri aya amakuru**	**I do not have access to this information Ntaburyo mfite bwo kubona aya makuru**	**I have limited access to this information Mfite aho ngarukira(umupaka) mukubona aya amakuru**	**I have easy access to this information Nshobora kubona aya amakuru kuburyo bworoshye**
124	The legal right of women regarding				

	assets, property and employment. Uburenganzira mumategeko bwumugore burebana numutungo utimikanywa, Amazu nakazi				
125	Where I can go to demand assistance to protect my assets, property and employment rights. Aho nshobora kujya gusaba ubufasha bwuburenganzira bwanjye bwo kurinda umutungo wanjye utimukanwa, amazu nakazi				
126	How to launch an enterprise. Uko batangira ubucuruzi				
127	How to get a foot to market. Uko ugeza bwa mbere ibicuruzwa Kwisoko				
128	How to access networks. Uko ubona abafatanyabikorwa				
129	How to standardise my products or services. Uko ibicuruzwa/service byazira inenge				
130	How to access successful				

	women entrepreneurs' stories. Uko nagera kubagore ba rwiyemezamiri mo bindashyikirwa.				
131	Effective training courses for female entrepreneurs. Amahugurwa ya ba rwiyemezamiri mo babagore				
132	Government policy that business needs to meet with. Amategeko ya leta ubucuruzi bugomba kubahiriza				
133	Finance support for women-owned businesses Amafaranga yo gushyigikira ubucuruzi bwabagore				
134	Understanding the terms and conditions of the loan Gusobanukirwa amabwiriza yinguzanyo				
135	How to successfully apply for a loan uko basaba inguzanyo kandi ukaboneka				
136	Online programmes and services important for female				

	entrepreneurs. programu/serivisi zingirakamaro kubacuruzi babagore ziboneka kuri Internet				
137	How to spot new business opportunities for women that are qualified. uko babona business nshya kubagore babifitiye ubushobozi				

138. Would you be happy to receive essential information through SMS on your mobile phone? Please tick one box. Wakwishimira kwakira amakuru yibanze yoherejwe hakoreshejwe ubutumwa bugufiya kuri telephone igendanwa? Tanga igisubizo kimwe.

Yes yego	
No oya	

139. Do you know any website or mobile application useful for a business?

Yes yego	
No oya	

Please indicate if you have the skills to use a cellphone, computer, and the Internet in your business. Please tick one box for each statement below. Irekana niba ufite ubumenyi mugukoresha cellphone, mudasobwa na Internet mubucuruzi bwawe. Tanga igisubizo kimwe kuri buri ngingo.

	Statement : Ingingo	**Yes**	**No**
140	I can use various cellphone program in my business. Nshobora gukoresha programu zitandukanye za cellphone mubucuruzi bwanjye		
141	I affirm having skills to use a cell phone in my business. Ndemeza ko mfite ubumenyi bwo gukoresha cellphone mubucuruzi bwanjye		
142	I want to learn more about how I can effectively use a cellphone in my business. Ndashaka kurushaho kwiga uko nakoresha binoze cellphone mubucuruzi bwanjye		
143	I can use the various computer program in my business. Nshobora gukoresha programu zitandukanye za mudasobwa mubucuruzi bwanjye		

144	I affirm having skills to use a computer in my business. Ndemaza ko mfite ubumenyi bwo gukoresha computer mubucuruzi bwanjye.		
145	I want to learn more about how I can effectively use a computer in my business.		
146	I can use the Internet in my business. Ndashaka kurushako kwiga uko nakoresha binoze mudasobwa mubucuruzi bwanjye.		
147	I affirm having skills to use the Internet in my business. Ndemeza ko mfite ubumenyi bwo gukoresha Internet mubucuruzi bwanjye .		
148	I want to learn more about how I can effectively use the Internet in my business. Ndashaka kurushaho kwiga uko nakoresha binoze Internet mubucuruzi bwanjye		

149. Which ICT training do you need to improve your business? You can select more than one option. Ni irihe hugurwa ryikoranabuhanga ukeneye muguteza imbere ubucuruzi bwawe? Ushobora guhiamo ibisubizo birenze kimwe.

Statement	**Tick the response with X**
Send and receive short message service(SMS) Kohereza no kwakira ubutumwa bugufi(SMS)	
Use the Internet on a cellphone. Gukoresha Internet kuri cellphone	
Learn more how a cellphone may be more useful such as using it for money transfer, obtaining business information, advertising, find new markets, etc. Kwiga kurushaho uko nabyaza telephone umusaruro urugero nko kohereza amafaranga, kubona amakuru arebana nubucuruzi, kwamamaza, gushaka amasoko mashya, nibindi	
Improve computer skills and be able to use accounting, inventory, bookkeeping software, etc. Kongera ubumenyi muri mudasobwa nkashobora gukoresha programu za comptabilite, kurangura ibintu no kuzuza ibitabo byubucuruzi, nibindi	
Utilise more Internet in business for promoting products, selling online and creating a website. Gukoresha cyane Internet mubucuruzi namamaza, ngurisha ibicuruzwa kandi nkakora na za programu/ website	
Other, please specify. Ibindi, bivuge	

150. Which methodology do you want to use during training? Please select one option. Nubuhe buryo bwo kwigisha ushaka gukoresha mumahugurwa? Hitamo bumwe

Face to face training Amahugurwa yimbona nkubone	
Using the Internet on the computer Guhoresha Internet kuri mudasobwa	
Using the Internet on a mobile phone Gukoresha Internet kuri telephone igendanwa	

Using SMS on mobile phone Gukoresha ubutumwa bugufi kuri telephone igendanwa	

Section 7: leadership and stakeholders' role to promote the use of ICT into women's businesses. Uruhare rw'ubuyozi nabafatanyabikorwa muguteza imbere ikoreshwa ryikoranabuhanga mubucuruzi bwabagore

This section responds fourth research question "Does Rwanda administration and stakeholders' information and communication technology policies support the successful integration and use of Information and communication technology in women small and medium enterprises in Kigali, Rwanda"? Iki gice kirasubiza ikibazo cya kane" amahame namabwiriza arebana nitumanaho rikoresha technology by'ubuyobozi bw'Urwanda nabafatanyabikorwa byaba bishyigikira ikoreshwa ryikoranabuhanga mubucuruzi buto nubuciriritse bwabagore muri Kigali, Rwanda"?

Please tick one box to each statement below. Strong agree 5; strong disagree 1 Shyira akamenyetso mukazu kamwe kuri bur ikibazo hasi aha.

	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
151 - 155	**Governement and stakerholders support for females**	1	2	3	4	5
151	Government and stakeholders encourage women-owned business in Kigali to use ICT in their daily business activities. . Leta nabafatanyabikorwa bashishikariza abagore bafite ubucuruzi muri Kigali gukoresha ikoranabuhanga mumirimo yabo yubucuruzi ya buri munsi					
152	Government and stakeholders give some ICT privileges to women entrepreneurs that male counterparts do not have. Leta nabafatanyabikorwa hari amahirwe amwe namwe yikoranabuhanga baha abagore ba rwiyemezamirimo abagabo baganzi babo batabona	1	2	3	4	5
153	The government gives same chance women and men entrepreneurs to access to IT & ICT products. Leta iha amahirwe angina ba rwiyemezamirimo babagore nabagabo yo kugera kwikoranabuhanga	1	2	3	4	5
154	Chamber of women entrepreneurs and stakeholders train women entrepreneurs on how to comply with the forms concerning the business (e.g. Register a business, import and export, RRA) using the Internet. Urugaga rwabagore ba rwiyemezamiri nabafatanyabikorwa bahugura abagore ba rwiyemezamirimo	1	2	3	4	5

	uko buzuza impapuro za leta (urugero kwandikisha ubucuruzi, gutumiza no kohereza ibintu mumahanga, nibindi birebana nikigo kiguhugu cyimisore namahoro).					
155	Chamber of women entrepreneurs and stakeholder organise ICT training programme which enable women-owned business in Kigali to be more efficient and effective in doing business. Urugaga rwabagore ba rwiyemezamiri nabafatanyabikorwa bategura kandi bagahugura ba rwiyemezamirimo babagore muri Kigali mwikoranabuganga ribongerera ubumenyi mugukora neza ubucuruzi.	1	2	3	4	5

156. If you agree or strongly agree to question 155, to which extent you can rate the frequency of training? Always 5; never 1, please select one option Niba wemera cg wemera cyane ikibazo 155, ni kuruhe rugero amahugurwa abamo? Hitamo ikibazo kimwe

Always Buligihe	5
Very often Hafi burigihe	4
Sometime Rimwe narimwe	3
Rarely Gake	2
Never Ntabyo	1

157. If you received training how you can rate its importance in improving your way of doing business. Very important 5; not at all important 1. Please select one option. Niba warabonye amahugurwa ni kuruhe rwego rwumumaro byakugiriye muguteza imbere ubucuruzi bwawe.

Very important Byangiriye akamaro cyane	1
Fairly important Byangiriye umumaro uhagije	2
Important Ingirakamaro	3
Slightly important Byangiriye akamaro gake	4
Not at all important Ntacyo byamariye	5

158. Select one or more training you attended
Erekana rimwe cg amahugurwa menshi wagiyemo

Access to finance uko wabona amafaranga	
Bookkeeping Kuzuza ibitabo byubucuruzi	
Buying/ selling products/ services online (E-commerce) using Internet Kugura no kugurisha ibicuruzwa kuri Internet	
Importation and exportation Gutumiza no kohereza ibicuruzwa mumahanga	
Effective using Internet Gukoresha neza Internet mukongera umusaruro	

Effective using mobile phone Gukoresha neza telephone igendamwa mukongera umusaruro	
Advertising products and services Kwamamaza ibicuruzwa na serivisi	
Comply with government documents Kuzuza neza impapuro za leta	
Market research. Ubushakashatsi bwisoko	
Other, please specify Ibindi, bivuge	

159. Is there an ICT competition among women-owned business in Kigali and awards for the best winner. Choose one response. Haba hari amarushanwa yo gukoresha ikoranabuhanga mubagore ba rwiyemezamirimo I Kigali maze indashyikirwa zigahembwa. Hitamo igisubizo kimwe.

Yes yego	
No oya	

160. How do you rate the Internet network coverage in your business area? Very good 5; very poor 1. Please select one option. Ni kuruhe rugero network ya Internet ikoraho mugace ukoreramo. Tanga igisubizo kimwe.

Very Good Neza cyane	5
Good neza	4
Fair murugero	3
Poor buhoro	2
Very poor	1

161. How do you rate mobile phone network coverage in your business area? Please tick one box. Ni kuruhe rugero network ya cellphone ikoraho mugace ukoreramo? Tanga igisubizo kimwe.

Very good neza cyane	5
Good neza	4
Fair murugero	3
Poor buhoro	2
Very poor buhoro cyane	1

APPENDIX B: FINDINGS

Table 1: Marital status

	Frequency	Percent
Yes	325	79.46
No	84	20.54
Total	409	100.00

Table 2: Marital status (in detail)

	Frequency	Percent
Married	248	75.61
Separated	32	9.76
Divorced	24	7.32
Widowed	24	7.32
Total	328	100.0

Table 3: Age group

Years	Frequency	Percent	Cumulative Percent
21-30	103	27.9	27.9
31-40	167	45.3	73.2
41-50	88	23.8	97.0
51-60	11	3.0	100.0
Total	369	100.0	

Table 4: Education

	Frequency	Percent
No formal education	25	6.2
Primary school	114	28.1
Vocational training	0	0
Secondary school	173	42.6
National diploma	40	9.9
Bachelor's degree	47	11.6
Master's degree	5	1.2
Doctorate degree	2	0.5
Total	406	100.0

Table 5: Nationality

	Frequency	Percent
Rwandan	362	98.9
Foreigner	4	1.1
Total	366	100.0

Table 6: Members of the Rwanda Chamber of Women Entrepreneurs

	Frequency	Percent
yes	18	4.4
No	389	95.6
Total	407	100.0

Table 7: Occupation before you started a business

	Frequency	Percent
I was doing the same business for an employer	8	2.0
I was working for a private company	51	12.47
I was working for the government	32	7.82
I did not have a job	235	57.46
I was a student	61	14.91
I was a domestic worker	14	3.42
Other (please identify)	8	1.96
Total	409	100.0

Table 8: Opportunity to participate in learning business courses

	Frequency	Percent
Yes	38	9.29
No	371	90.71
Total	409	100.0

Table 9: Entrepreneurship training

	Frequency	Percent
Yes	36	8.93
No	367	91.07
Total	403	100.0

Table 10: Training organiser

	Frequency	Percent
Chamber of women entrepreneurs	8	20.51
Private Sector Federation	11	28.20
Goldman Sachs 10 000	0	0.00
Women for women	5	12.82
Peace Through Business (PTB)	0	0.00
Business Professionals Network (BPN)	1	2.56
MTN	2	5.12
AIRTEL TIGO	2	5.12
TVET School (short course)	1	2.56
Other, please specify. (Youth training centre, The salvation Army Church, NGO, Akazikanoze, DUTERIMBERE IMF, etc.)	9	23.08
Total	39	100.0

Table 11: Help of entrepreneurial training in doing better business

	Frequency	Percent
Bookkeeping	23	14.6
Entrepreneurship skills	29	18.4
Financial management	17	10.8
Improve my ICT skills	9	5.7
Marketing skills	22	13.9
Networks relationship	21	13.3
Personnel management	16	10.1
Time management	16	10.1
Nothing, it did not help	-	0
Other, please specify (Getting knowledge about tailing, Business preparation and implementation, innovation, Tailoring, Sewing, etc.)	5	3.2
	158	100.0

Table 12: Number of businesses

	Frequency	Percent	Cumulative Percent
1	362	97.05	97.05
2	8	2.14	99.2
3	0	0.00	99.2
4	1	0.27	99.5
5	0		
6	0		
7	1	0.27	100.0
Total	373	100.0	

Table 13: Legal category of business

	Frequency	Percent
Sole proprietorship	400	98.28
Limited by shares	6	1.47
Limited by guarantee	1	0.25
Limited by shares and by guarantee	0	
Unlimited	0	
Total	407	100.00

Table 14: Industry

	Frequency	Percent
Agriculture	2	0.49
Construction	3	0.74
Exportation		
ICT	10	2.45
Importation	5	1.23
Manufacturing	3	0.74
Retail	89	21.81
Services	239	58.58
Transportation	1	0.25
Wholesale	47	11.52
Other, please specify (Alimentation , Forex bureau, Hardware, sewing, hand made, Nursery school, Precast)	9	2.21
Total	408	100.00

Table 15: Type of service

	Frequency	**Percent**
Accommodation (e.g. lodges, letting the house or flat, etc.)	4	1.60
Cleaning	8	3.21
Clothing (e.g. sewing, buying & selling)	28	11.24
Entertainment (e.g. tourism, event organisation**)**	2	0.80
Food (e.g. restaurant)	35	14.05
Hairdresser (salon)	28	11.24
Handicrafts	13	5.22
Hardware	5	2.01
Exportation	0	
Importation	2	0.80
Professional (e.g. Legal, Medicine, Information technology, Accounting, etc.)	5	2.01
Transport	2	0.80
Selling (electricity, vegetables, drinking water, fruits, mobile phones, charcoal, stationary)	44	17.7
Airtel tigo + MTN	37	14.9
Tailoring	8	3.21
Other, specify (bank agent, butchery, canteen (soft drinks), car wash, cement dealer, driving school, dry cleaning, event and party decoration, forex bureau, fuel station, gas cooker, Irembo services, motel, Recreation place, Small supermarket)	28	11.2
Total	**249**	**100.0**

Table 16: Age of business

Age of business (years)	Frequency	Percent	Cumulative Percent
1 – 5	206	54.5	54.5
6 – 10	114	30.2	84.7
11 – 15	47	12.4	97.1
16 – 42	11	2.9	100.0
Total	378	100.0	

Table 17: Primary source of money

	Frequency	Percent
Bank	107	14.4
Church	18	2.4
Family	78	10.5
Friends	78	10.5
Government	13	1.7
Husband	178	23.9
microfinance	61	8.2
My savings	174	23.4
Non- governmental organisation(NGO)	13	1.7
Pension	0	0
Other, please specify (BDF & selling land, forest, house and property)	25	3.4
Total	745	100.0

Table 18: Capital

	Frequency	Percent	Cumulative Percent
Less RwF 500 000	119	29.17	29.2
RwF 500 000 - 15 000 000	269	65.93	95.1
RwF 15 000 000 - 75 000 000	16	3.93	99.03
More than 75 000 000	4	0.98	100.0
Total	408	100.0	

Table 19: Number of workers a business had

	Frequency	Percent	Cumulative Percent
1 -3	340	88.8	88.8
4 – 30	43	11.3	100.0
31 – 100	0	0	100.0
More than 100	0	0	
Total	383	100.0	

Table 20: Annual income

	Frequency	Percent	Cumulative Percent
Less R300 000	8	2.0	2.0
RwF 300 000 – 12 000 000	387	94.9	96.9
RwF 12 000 000 – 50 000 000	12	2.95	100.0
More than 50 000 000	1	0.25	100.0
Total	408	100.0	

Table 21: How the business was started

	Frequency	Percent
On scratch	237	58.52
As a family business	92	22.72
It was my owner initiative	30	7.41
Bought out existing business	43	10.62
business succession	3	0.74
Franchise	0	0
Other, please identify		
Total	405	100.00

Table 22: Where the business was registered

	Frequency	Percent
Minicipality	42	10.3
District	34	8.4
Rwanda Cooperative Agency (RCA)	0	0
Private sector Federation (PSF)	1	0.25
Rwanda Development Board (RDB)	32	7.9
Social Security Board (RSSB)	0	0
Rwanda Revenue Authority (RRA)	294	72.4
FERWACOTAMO	1	0.25
Other	0	0
Total	404	100.0

Table 23: Preferred customers

	Frequency	Percent
City of Kigali (Kigali habitant)	370	91.81
National (consumers from other provinces outside of Kigali	27	6.70
Foreign (consumers from outside the country such as tourists)	6	1.49
Total	403	100.0

Table 24: Shareholders

	Frequency	Percent
Yes	7	1.84
No	373	98.16
	380	100.0

Table 25: Number of shareholders

	Frequency/Percent	Percent
Women (write number)	6	27.3
Men (write number)	16	72.7
Total	22	100.0
Shares		
How many shares do you have in business (write a percentage %)	25% - 100%	

Table 26: Current status of business

	Frequency	Percent
Growing	361	88.5
Stagnating	39	9.6
Not growing	8	2.0
Total	408	100.0

Table 27: Areas in which a business is growing

	Frequency	Percent
An increasing number of employees	165	13.7
Increasing sales	172	14.3
Increasing incomes	264	21.9
increasing benefits	330	27.4
Increasing range of products	157	13.0
Extended services	99	8.2
Extended markets	18	1.5
Extended on the international market	0	0
Other, please specify	0	0
Total	1205	100.0

Table 28: Why a business is not growing

	Frequency	Percent
More competitors	31	18.0
Small working capital	16	9.3
No access to loans	11	6.4
More taxes paid	35	20.3
Few consumers	7	4.1
Consumers do not like to support women businesses	0	0
I use more money in the family	22	12.8
Expensive rent	33	19.2
High communication prices	7	4.1
High-interest rates paid	10	5.8
Other, please specify	0	
Total	172	100.0

Table 29: Performance of business

	Frequency	Percent
Performing very well	229	56.82
Performing fairly	107	26.55
Neutral	49	12.16
Performing poorly	15	3.72
Not performing	3	0.74
Total	403	100.0

Table 30: Changes businesses brought

	Frequency	Percent
Build a house	52	3.7
Buy a car	7	0.5
Education fees for my family	239	17.0
Mutual Health insurance for my family	261	18.5
Respect in family and community	303	21.5
Recreation and leisure time	269	19.1
Improved lifestyle	279	19.8
Other specify	0	0
Total	1410	

Table 31: Business plan

	Frequency	Percent
Yes	155	38.46
No	248	61.54
Total	403	100.0

Table 32: Reasons for starting a business

	Frequency	Percent
Push factors (necessity entrepreneurs)		
Unemployment	234	57.4
Maltreatment where I worked	10	2.5
Job dissatisfactions	24	5.9
Divorce or separation	13	3.2
Death of husband	4	1.0
Unwanted pregnancy	0	0
Refugee	1	0.2
I am not educated to find a job in the labour market	10	2.5
Pull foctors (opportunity entrepreneurs)		
Independence	12	2.9
My contract with my employer terminated	14	3.4
Fulfilment my entrepreneur intention	6	1.5
Self-actualisation	25	6.1
Innovation	9	2.2
I needed time to care for my family while generating income	29	7.1
I needed to generate more revenue	6	1.5
Education, training and experience	3	0.7
Challenge men by showing them that women can also start and run a successful business	8	2.0
Total	**408**	**100.0**

Table 33: Permission to start a business

	Frequency	percent
Yes I did and my husband was supportive	227	56.2
Yes I did but my husband was not supportive	9	2.2
No I did not	77	19.1
It was my husband proposition	25	6.2
No husband, I made the decision myself (widow)	14	3.5
Yes I asked for permission from my family and they were supportive (single)	41	10.1
No, I did not ask for permission from my family (single)	11	2.7
Total	404	100.0

Table 34: Mean scores and t-test results

	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
34 - 39	**Gender inequality**					
34	There is gender inequality in business	58.37	40.15	1.23	0	0.25
35	Being a woman is a negative factor in business	64.95	28.43	6.13	0	0.49
36	Customs and local culture disadvantage women to operate a business	54.41	29.90	12.75		0.74
37	It is difficult for women to access finance	43.98	30.22	17.69	7.37	0.74
38	Inability to travel because of family/ husband obligations	14.67	16.63	26.41	31.54	10.76
39	Sexual harassment is a constraint	14.29	29.31	25.37	21.43	9.61
40 - 42	**Financial constraints**					
40	High-interest rates is a constraint	12.32	27.83	30.79	19.95	9.11
41	Short term to pay back the loan is a constraint	13.12	25.99	19.80	31.93	9.16
42	Collateral to obtain a loan is a constraint	29.95	12.38	20.05	29.70	7.92
43 - 52	**Government constraints**					
43	Lack of a support network is a constraint	32.03	30.07	10.27	20.78	6.85

44	Access to government service is a constraint	3.69	7.86	16.22	49.88	22.36
45	Business registration is a constraint	3.93	21.38	17.20	37.84	19.66
46	High taxes is a constraint	1.97	5.67	23.65	49.01	19.70
47	Lack of market opportunities is a constraint	1.72	7.62	19.41	50.37	20.88
48	A bribe of government officials is a constraint	3.69	15.52	21.92	42.12	16.75
49	Inability to obtain public tender is a constraint	4.18	11.55	16.22	49.88	18.18
50	High transport cost is a constraint	10.27	17.85	25.92	33.01	12.96
51	High communication cost is a constraint	9.80	24.02	15.93	33.09	17.16
52	Lack of incubator centre is a constraint	12.81	18.97	17.49	33.50	17.24
53 - 57	**Skills constraints**					
53	Lack of education and training is a constraint	8.09	7.11	15.93	44.61	24.26
54	Lack of entrepreneurial skills is a constraint	1.23	4.44	17.28	41.48	35.56
55	Lack of management skills is a constraint	4.17	22.06	20.83	34.56	18.38
56	Lack of business experience is a constraint	1.74	15.38	20.84	34.99	27.05
57	Lack of information technology skills (e.g. Internet) is a constraint	1.96	15.44	22.06	32.35	28.19
58 - 59	**Own fear**					
58	HIV/AIDS is a constraint	0	1.97	5.65	34.89	57.49
59	Fear of failure is a constraint	4.42	20.64	17.94	23.34	33.66

….. Continuation of table 34.

	Statement	Mean	Std.dev	t-value	Result	Meaning
34 - 39	**Gender inequality**					
34	There is gender inequality in business	1.46	0.029	-57.458	Rejected	Disagreed
35	Being a woman is a negative factor in business	1.44	0.035	-48.639	Rejected	Disagreed
36	Customs and local culture disadvantage women to operate a business	1.68	0.047	-30.382	Rejected	Disagreed
37	It is difficult for women to access finance	1.92	0.052	-22.378	Rejected	Disagreed
38	Inability to travel because of family/ husband obligations	3.08	0.063	1.172	Not rejected	Neutral
39	Sexual harassment is a constraint	2.78	0.062	-2.898	Rejected	Disagreed
40 - 42	**Financial constraints**					
40	High-interest rates is a constraint	2.82	0.058	-2.508	Rejected	Disagreed
41	Short term to pay back the loan is a constraint	2.97	0.063	-0.328	Not rejected	Neutral
42	Collateral to obtain a loan is a constraint	2.75	0.071	-3.931	Rejected	Disagreed
43 - 52	**Government constraints**					
43	Lack of a support network is a constraint	2.37	0.067	-9.221	Rejected	Disagreed
44	Access to government service is a constraint	3.78	0.052	16.077	Rejected	Agreed
45	Business registration is a constraint	3.46	0.060	8.447	Rejected	Agreed
46	High taxes is a constraint	3.77	0.046	17.817	Rejected	Agreed
47	Lack of market opportunities is a constraint	3.79	0.047	17.969	Rejected	Agreed
48	A bribe of government officials is a constraint	3.49	0.055	10.040	Rejected	Agreed
49	Inability to obtain public tender is a constraint	3.65	0.055	12.931	Rejected	Agreed

50	High transport cost is a constraint	3.14	0.062	3.512	Rejected	Agreed
51	High communication cost is a constraint	3.17	0.067	3.800	Rejected	Agreed
52	Lack of incubator centre is a constraint	3.18	0.068	3.642	Rejected	Agreed
53 - 57	**Skills constraints**					
53	Lack of education and training is a constraint	3.68	0.061	12.250	Rejected	Agreed
54	Lack of entrepreneurial skills is a constraint	4.04	0.048	23.542	Rejected	Agreed
55	Lack of management skills is a constraint	3.37	0.060	7.241	Rejected	Agreed
56	Lack of business experience is a constraint	3.66	0.057	13.062	Rejected	Agreed
57	Lack of information technology skills (e.g. Internet) is a constraint	3.65	0.057	12.760	Rejected	Agreed
58 - 59	**Own fear**					
58	HIV/AIDS is a constraint	4.47	0.037	42.994	Rejected	Agreed
59	Fear of failure is a constraint	3.54	0.067	9.780	Rejected	Agreed

Table 35: Devices owned

	Frequency	Percent
Cellphone	26	30.2
Computer	14	16.3
Laptop	15	17.4
Tablet	9	10.5
Radio	13	15.1
Television	8	9.3
Fax machine	1	1.2
Total	86	100.0

Table 36: Internet access

	Frequency	Percent
Yes	320	79.80
No	81	20.20
Total	401	100.0

Table 37: Device used

	Frequency	Percent
Cellphone	338	64.6
Computer	110	21.0
Tablet	8	1.5
Laptop	67	12.8
Total	523	100.0

Table 38: Where they access the Internet

	Frequency	Percent
At home	309	33.3
At a friend's home	131	14.1
At work/office	230	24.8
At a friend's work/office	90	9.7
At an Internet café	117	12.6
At a public library	48	5.2
At a entrepreneurship club	2	0.2
other	0	0
Total	**927**	**100.0**

Table 39: Use of devices

	Device	Never	Rarely	Sometimes	Very often	Always
64	Cellphone	0	0.49	0.24	25.92	73.35
65	Computer	49.14	40.54	2.95	5.41	1.97
66	Laptop	65.36	20.64	5.16	6.88	1.97
67	Tablet	94.81	3.21	1.73	0.25	0
68	Internet café	27.90	41.48	23.46	6.42	0.74
69	Radio	34.81	18.02	11.85	23.70	11.60
70	Television	65.53	10.02	6.60	10.02	7.82
71	Fax machine	98.52	0.99	0.49	0	0

Table 40: Rate of utilisation of ICT

	Frequency	Percent
Very important	65	15.93
Important	181	44.36
Neutral	107	26.23
Less important	49	12.01
Useless	6	1.47
Total	408	100.0

Table 41: Use of ICT instruments

	Frequency	Percent
Strongly agree	67	16.42
Agree	158	38.73
Neutral	74	18.14
Disagree	83	20.34
Strongly disagree	26	6.37
Total	408	10.0

Table 42: Competency

		Statement	Frequency	Percent
1	Unfamiliar	I do not have the skills to use computer technology	76	18.72
2	Newcomer	I do have little skills to use a computer; I am struggling and need help to use technology.	11	2.71
3	beginner	I have basic skills to use some application	66	16.26
4	Average	I can use some computer applications	197	48.52
5	Advanced	I can use adequately more computer application	54	13.30
6	Expert	I am specialist in computer programmes	2	0.49
	Total		406	100.0

Table 43: Activities performed on the computer

	Frequency	Percent
Bookkeeping (accounting, stock taking etc.)	163	11.8
Sending and receiving money	221	16.0
Buying products/services (e.g. Stock) online using the Internet	34	2.5
Selling products/services online using the Internet	37	2.7
Sending and receiving emails	227	16.5
Importation online using the Internet	24	1.7
Exportation online using the Internet	4	0.3
Track freights online using the Internet	11	0.8
Conference video using the Internet	62	4.5
Learning and training online using the Internet	41	3.0
Advertising product/service on socio-media	140	10.2
The searching market of your product/services Gushaka isoko ryibicuruzwa/servisi byawe	165	12.0
Exchange with networks via social media (e.g. Facebook, histogram, WhatsApp)	250	18.1
Total	1379	100.0

Table 44: Online access

	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
76	I search for information on the Internet on how a woman can achieve success in business.	45.70	40.05	5.65	5.65	2.95
77	I use the Internet to search how I can cope with beliefs and cultural challenge women entrepreneurs.	52.59	32.10	8.15	4.69	2.47
78	I search for information on the Internet on how I can access to finance such as finding loans on good deals.	52.46	30.30	10.84	4.19	2.22
79	I search for information on the Internet on where I can access finance for instance find a loan on a good deal	52.22	30.30	10.84	3.69	2.96
80	I search for information on the Internet where I can get a loans with lower interest rates.	55.53	26.29	10.81	4.67	2.70
81	I search for information on the Internet on how to apply successful a loan.	52.46	28.82	10.59	5.42	2.71
82	I search for information on the Internet on where I can obtain loans that do not demand guarantee.	52.72	28.47	11.14	5.20	2.48
83	I search networks on the Internet to find who I can collaborate with to improve my business.	53.81	28.99	8.85	6.39	1.97
84	I use the Internet to access government services.	15.16	13.45	22.74	41.32	7.33
85	I registered my business online.	24.21	14.43	14.18	38.14	9.05
86	I search for information on the Internet on how to run a legal business and pay low taxes.	47.92	27.38	9.29	10.51	4.89
87	I use the Internet to learn how business works.	46.52	27.36	15.67	7.96	2.49
88	I use the Internet to learn how I can manage the business and make it succeed.	54.52	28.85	10.51	4.16	1.96
89	I search new online markets to find where I can sell my products or services.	57.49	26.29	9.34	4.91	1.97
90	I advertise my products or services online or on social media.	37.19	32.76	15.02	12.81	2.22

91	I communicate with my networks via email to limit travel to meet face to face.	50.37	22.25	13.94	10.27	3.18
92	I discuss business on a cellphone with my networks instead to travel to meet them.	27.87	17.60	13.69	26.89	13.94
93	I order my stock online	66.01	18.47	9.11	4.43	1.97
94	I order my stock via cellphone	9.31	2.45	8.82	45.34	34.07
95	I search for information on the Internet regarding right against sexual abuse	45.21	30.96	6.88	11.06	5.90
96	I search for information on the Internet regarding public health	39.22	32.11	6.13	14.71	7.84
97	I search for information on the Internet regarding HIV/AIDS	35.78	22.79	11.76	18.14	11.52
98	I search for information on the Internet regarding my right and punishment for giving and receiving a bribe .	48.40	27.03	11.30	7.13	6.14
99	I search for information on the Internet regarding public tender and how to compete within the markets	53.19	30.64	7.35	4.41	4.41
100	I search for information on the Internet on how to limit the transport cost.	50.61	34.15	7.13	4.42	3.69
101	I search for information on the Internet on how to limit the communication cost.	48.40	31.60	11.85	4.44	3.70

……Continuation of table 5.44

	Statement	Mean	Std.dev.	t-value	Result	Meaning
76	I search for information on the Internet on how a woman can achieve success in business.	1.80	0.984	-24.590	Rejected	Disagreed
77	I use the Internet to search how I can cope with beliefs and cultural challenge women entrepreneurs.	1.72	0.971	-26.453	Rejected	Disagreed
78	I search for information on the Internet on how I can access to finance such as finding loans on good deals.	1.73	0.9 65	-26.430	Rejected	Disagreed
79	I search for information on the Internet on where I can access finance for instance find a loan on a good deal	1.75	.992	-25.420	Rejected	Disagreed
80	I search for information on the Internet where I can get a loans with lower interest rates.	1.73	1.011	-25.405	Rejected	Disagreed
81	I search for information on the Internet on how to apply successful a loan.	1.79	1.020	-24.270	Rejected	Disagreed
82	I search for information on the Internet on where I can obtain loans that do not demand guarantee.	1.76	1.001	-24.687	Rejected	Disagreed
83	I search networks on the Internet to find who I can	1.74	.996	-25.577	Rejected	Disagreed

	collaborate with to improve my business.					
84	I use the Internet to access government services.	3.12	1.198	2.063	Rejected	Agreed
85	I registered my business online.	2.93	1.362	-0.98	Not rejected	Neutral
86	I search for information on the Internet on how to run a legal business and pay low taxes.	1.97	1.198	-17.375	Rejected	Disagreed
87	I use the Internet to learn how business works.	1.93	1.078	-19.992	Rejected	Disagreed
88	I use the Internet to learn how I can manage the business and make it succeed.	1.70	0.969	-27.586	Rejected	Disagreed
89	I search new online markets to find where I can sell my products or services.	1.676	0.969	-27.573	Rejected	Disagreed
90	I advertise my products or services online or on social media.	2.101	1.108	-16.355	Rejected	Disagreed
91	I communicate with my networks via email to limit travel to meet face to face.	1.94	1.157	-18.588	Rejected	Disagreed
92	I discuss business on a cellphone with my networks instead to travel to meet them.	2.81	1.445	-2.601	Rejected	Disagreed
93	I order my stock online	1.579	0.965	-29.681	Rejected	Disagreed
94	I order my stock via cellphone	3.924	1.167	15.988	Rejected	Agreed
95	I search for information on the Internet regarding right against sexual abuse	2.015	1.224	-16.244	Rejected	Disagreed
96	I search for information on the Internet regarding public health	2.20	1.309	-12.372	Rejected	Disagreed
97	I search for information on the Internet regarding HIV/AIDS	2.47	1.423	-7.552	Rejected	Disagreed
98	I search for information on the Internet regarding my right and punishment for giving and receiving a bribe .	1.96	1.199	-17.577	Rejected	Disagreed
99	I search for information on the Internet regarding public tender and how to compete within the markets	1.76	1.061	-23.570	Rejected	Disagreed
100	I search for information on the Internet on how to limit the transport cost.	1.76	1.016	-24.533	Rejected	Disagreed
101	I search for information on the Internet on how to limit the communication cost.	1.83	1.044	-22.476	Rejected	Disagreed

Table 45: Source of news, information, and counsel for your business

	Frequency	Percent
Chamber of women entrepreneurs	0	0
Kigali Gas Ltd	1	0.25
Cellphone	247	60.54
Government publication	10	2.45
Internet on a cellphone	44	10.78
Internet on laptop	11	2.70
Newspaper	8	1.96
Private sector federation	3	0.74
Radio	29	7.11
Television	10	2.45
In cooperative	1	0.25
Word of mouth	43	10.54
From the drinking water supplier	1	0.25
Other (please identify).	0	0
Total	408	100.0

Table 46: Communication channels

	Statement	**Internet on computer**	**Internet on a cellphone**	**SMS**	**Calls**
103	Receiving information regarding products/services.	3.19	40.79	7.62	48.40
104	Obtaining information about health; nutrition, diseases, public health.	7.33	40.59	16.14	35.94
105	Communicate with the government, download form, complete form online, pay online, and register business, RRA.	43.73	43.24	6.39	6.63
106	Send and receive emails.	20.06	65.25	3.39	11.30
107	Using Internet, Skype, WhatsApp etc.	5.25	84.84	1.17	8.75
108	Buying products/ services.	1.71	4.16	4.89	89.24
109	Demand information to suppliers.	2.46	4.19	5.42	87.93
110	Selling products/services.	1.23	2.71	6.40	89.66
111	Consumers demand information.	3.71	3.22	9.41	83.66
112	Sending/ receiving/ paying money.	0	1.96	49.26	48.77
113	Short training/ tertiary education.	27.18	4.24	5.74	62.84
114	Using social media.	0.49	24.38	1.48	73.65
115	Findings new consumers.	1.48	2.46	2.96	93.10
116	Finding suppliers	0.73	3.42	2.20	93.64
117	Communicate with business networks/ association/ group chart.	6.17	24.44	11.85	57.53
118	Comply with government requirements such as registering business online, paying taxes online, apply the licence.	43.60	4.43	4.43	47.54
119	Obtaining information that can help me make decisions in my business.	11.63	7.43	1.98	78.96
120	Doing market research	2.71	17.00	0.99	79.31
121	Daily filling business books using software for, e.g. Stocktaking, accounting, and employee's management.	35.37	4.79	1.86	57.98
122	Advertising my product and services.	2.46	17.44	1.97	78.13
123	Obtaining business support services (incubation centre; advices, business development, etc.).	27.89	2.01	9.30	60.80

SMS: Short Message Service

Table 47: Important information not obtained

	Statement	I need access to this information	I do not have access to this information	I have limited access to this information	I have easy access to this information
124	The legal right of women regarding assets, property and employment.	7.58	1.22	2.44	88.75
125	Where I can go to demand assistance to protect my assets, property and employment rights.	5.15	2.21	5.64	87.01
126	How to launch an enterprise.	51.11	10.62	9.63	28.64
127	How to get a foot to market.	50.12	18.92	7.86	23.10
128	How to access networks.	52.58	13.76	12.53	21.13
129	How to standardise my products or services.	52.59	15.31	11.85	20.25
130	How to access successful women entrepreneurs' stories.	63.18	11.44	13.93	11.44
131	Effective training courses for female entrepreneurs.	63.97	9.07	13.73	13.24
132	Government policy that business needs to meet with.	55.88	9.56	12.01	22.55
133	Finance support for women-owned businesses	61.82	13.05	11.82	13.30
134	Understanding the terms and conditions of the loan	43.24	2.70	12.53	41.52
135	How to successfully apply for a loan	42.12	1.23	12.56	44.09
136	Online programmes and services important for female entrepreneurs.	73.83	6.42	6.17	13.58
137	How to spot new business opportunities for women that are qualified.	67.24	13.69	5.13	13.94

Table 48: Receiving essential information through SMS

	Frequency	Percent
Yes	398	98.27
No	7	1.73
Total	405	100.0

Table 49: Knowledge of website or mobile application

	Frequency	Percent
Yes	245	60.34
No	161	39.66
	406	**100.0**

Table 50: Skills to use a cellphone, computer, and the Internet

	Statement:	Yes (%)	No (%)	Total Percent
140	I can use various cellphone program in my business.	55.17	44.83	100.0
141	I affirm having skills to use a cellphone in my business.	36.05	63.95	100.0
142	I want to learn more about how I can effectively use a cellphone in my business.	76.47	23.53	100.0
143	I can use the various computer program in my business.	31.11	68.89	100.0
144	I affirm having skills to use a computer in my business.	20.45	79.55	100.0
145	I want to learn more about how I can effectively use a computer in my business.	86.49	13.51	100.0
146	I can use the Internet in my business.	35.14	64.86	100.0
147	I affirm having skills to use the Internet in my business.	23.46	76.54	100.0
148	I want to learn more about how I can effectively use the Internet in my business.	88.18	11.82	100.0

Table 51: ICT training

Statement	Frequency	Percent
Send and receive short message service(SMS)	6	0.5
Use the Internet on a cell phone.	115	10.5
Learn more how a cell phone may be more useful such as using it for money transfer, obtaining business information, advertising, find new markets, etc.	269	24.5
Improve computer skills and be able to use accounting, inventory, bookkeeping software, etc.	352	32.1
Utilise more Internet in business for promoting products, selling online and creating a website.	354	32.3
Other, please specify.	0	0
Total	1096	100.0

Table 52: Methodology of training

	Frequency	Percent
Face to face training	311	76.04
Using the Internet on the computer	11	2.69
Using the Internet on a mobile phone	30	7.33
Using SMS on mobile phone	57	13.94
Total	409	100.0

Table 53: Leadership and stakeholders' role to promote the use of ICT into women's businesses

	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
151 - 155	Government and stakeholders support for females					
151	Government and stakeholders encourage women-owned business in Kigali to use ICT in their daily business activities.	0.74	11.27	24.51	49.02	14.46
152	Government and stakeholders give some ICT privileges to women entrepreneurs that male counterparts do not have.	12.53	23.83	17.69	35.14	10.81
153	The government gives same chance women and men entrepreneurs to access to IT & ICT products.	0.24	7.58	10.51	45.48	36.19
154	Chamber of women entrepreneurs and stakeholders train women entrepreneurs on how to comply with the forms concerning the business (e.g. Register a business, import and export, RRA) using the Internet.	3.19	22.36	19.9	45.45	9.09
155	Chamber of women entrepreneurs and stakeholder organise ICT training programme which enable women-owned business in Kigali to be more efficient and effective in doing business.	3.21	33.33	18.52	36.54	8.4

….. continuation of table 53.

	Statement	Mean	Std.dev.	T -value	Result	Meaning
151 - 155	Government and stakeholders support for females					
151	Government and stakeholders encourage women-owned business in Kigali to use ICT in their daily business activities.	3.65	0.888	14.838	Rejected	Agreed
152	Government and stakeholders give some ICT privileges to women entrepreneurs that male counterparts do not have.	3.08	1.233	1.286	Not rejected	Neutral
153	The government gives same chance women and men entrepreneurs to access to IT & ICT products.	4.098	0.886	25.066	Rejected	Agreed
154	Chamber of women entrepreneurs and stakeholders train women entrepreneurs on how to comply with the forms concerning the business (e.g. Register a	3.35	1.025	6.868	Rejected	Agreed

	business, import and export, RRA) using the Internet.					
155	Chamber of women entrepreneurs and stakeholder organise ICT training programme which enable women-owned business in Kigali to be more efficient and effective in doing business.	3.141	1.071	2.551	Rejected	Agreed

Table 54: Rating the frequency of training

	Frequency	Percent
Always	25	8.74
Very often	23	8.04
Sometime	173	60.49
Rarely	55	19.23
Never	10	3.25
Total	286	100.0

Table 55: Rating of the importance of training in business

	Frequency	Percent
Very important	37	9.27
Fairly important	133	33.33
Important	91	22.81
Slightly important	113	28.32
Not at all important	25	6.27
Total	399	100.0

Table 56: Training attended

	Frequency	Percent
Access to finance	212	19.4
Bookkeeping	191	17.5
Buying/ selling products/ services online (E-commerce) using Internet	31	2.8
Importation and exportation	0	0
Effective using Internet	141	12.9
Effective using mobile phone	149	13.6
Advertising products and services	124	11.3
Comply with government documents	174	15.9
Market research. Ubushakashatsi bwisoko	71	6.5
Other, please specify	0	0
Total	1093	100.0

Table 57: ICT competition and awards

	Frequency	Percent
Yes	327	82.78
No	68	17.22
Total	395	100.0

Table 58: Rating of the Internet network coverage

	Frequency	Percent
Very Good	81	19.80
Good	210	51.34
Fair	103	25.18
Poor	13	3.18
Very poor	2	0.49
Total	409	100.0

Table 59: **Rating of the mobile network coverage**

	Frequency	Percent
Very good	271	66.42
Good	107	26.23
Fair	29	7.11
Poor	1	0.25
Very poor	0	0
Total	408	100.0

Table 60: Reliability statistics of the gender inequalities construct: Correlation matrix

	Gender_inequality1	Gender_inequality2	Gender_inequality3	Gender_inequality4	Gender_inequality5	Gender_inequality6
Gender_inequality1	1					
Gender_inequality2	0.458*					
Gender_inequality3	0.418*	0.316*	1			
Gender_inequality4	0.273*	0.234*	0.268*	1		
Gender_inequality5	-0.293*	-0.166*	-0.093	0.003	1	
Gender_inequality6	-0.409*	-0.283*	-0.152*	-0.169*	0.568*	1

Note: The stars (*) attached to the correlation coefficient estimates in the table indicate that the correlation between the variables is statistically significant at the 5 level of significance.

Table 61: Reliability statistics

Item	No. of observations	Sign	Item-test correlation	Item-rest correlation	Alpha
Gender_inequality1	406	+	0.679	0.579	0.581
Gender_inequality2	408	+	0.569	0.420	0.606
Gender_inequality3	408	+	0.532	0.305	0.626
Gender_inequality4	407	+	0.499	0.235	0.658
Gender_inequality5	409	-	0.650	0.376	0.615
Gender_inequality6	408	-	0.768	0.531	0.543
Test scale					0.650

Table 62: Reliability statistics of the government constraints construct
Correlation matrix

	Govt..1	Govt..2	Govt..3	Govt..4	Govt..5	Govt..6	Govt..7
Govt..1	1						
Govt..2	-0.084	1					
Govt..3	0.272*	0.362*	1				
Govt..4	0.350*	0.155*	0.254*	1			
Govt..5	0.089	0.155*	0.121*	0.192*	1		
Govt..6	0.442*	-0.097	0.173*	0.209*	0.335*	1	
Govt..7	0.452*	-0.261*	0.246*	0.330*	0.210*	0.473*	1
Govt..8	0.454*	-0.276*	0.231*	0.226*	0.116*	0.482*	0.785*
Govt..9	0.425*	-0.331*	0.122*	0.018	0.065	0.518*	0.534*
Govt..10	0.400*	-0.112*	0.190*	0.223*	0.202*	0.440*	0.354

	Govt..8	Govt..9	Govt..10
Govt..8	1		
Govt..9	0.612*	1	
Govt..10	0.321*	0.373*	1

Question that this item or question does not belong to this construct.

Table 63 Reliability statistics of government constraints

Item	No. of observations	Sign	Item-test correlation	Item-rest correlation	Alpha
Government_const1	404	+	0.696	0.581	0.732
Government_const2	404	-	0.297	0.090	0.804
Government_const3	409	+	0.401	0.219	0.786
Government_const4	407	+	0.429	0.295	0.769
Government_const5	405	+	0.336	0.211	0.777
Government_const6	408	+	0.711	0.610	0.728
Government_const7	403	+	0.788	0.714	0.714
Government_const8	408	+	0.777	0.698	0.716
Government_const9	407	+	0.709	0.593	0.728
Government_const10	407	+	0.612	0.502	0.745
Test scale					0.771

Table 64: Reliability statistics of the skills constraints construct
Correlation matrix

	Skills..1	Skills..2	Skills..3	Skills4	Skills..5
Skills..1	1				
Skills..2	0.571*	1			
Skills..3	0.599*	0.733*	1		
Skills..4	0.547*	0.508*	0.548*	1	
Skills..5	0.543*	0.408*	0.422*	0.491*	1

Table 65 Reliability statistics

Item	No. of observations	Sign	Item-test correlation	Item-rest correlation	Alpha
Skills_const1	407	+	0.831	0.708	0.792
Skills_const2	406	+	0.782	0.675	0.807
Skills_const3	407	+	0.808	0.708	0.799
Skills_const4	406	+	0.783	0.649	0.810
Skills_const5	406	+	0.761	0.571	0.842
Test scale					0.842

Table 66: Reliability statistics of the online access construct
Correlation matrix

	On Line..1	On Line..2	On Line..3	On Line..4	On Line..5	On Line..6	On Line..7
OnLine..1	1						
OnLine..2	0.698*	1					
OnLine..3	0.679*	0.723*	1				
OnLine..4	0.624*	0.688*	0.760*	1			
OnLine..5	0.571*	0.594*	0.750*	0.779*	1		
OnLine..6	0.562*	0.562*	0.737*	0.791*	0.727*	1	
OnLine..7	0.553*	0.568*	0.708*	0.759*	0.808*	0.760*	
OnLine..8	0.508*	0.552*	0.664*	0.607*	0.639*	0.687*	0.694*
OnLine..9	0.158*	0.193*	0.288*	0.274*	0.305*	0.294*	0.340*
OnLine..10	0.340*	0.381*	0.342*	0.311*	0.302*	0.263*	0.307*
OnLine..11	0.441*	0.478*	0.538*	0.569*	0.588*	0.546*	0.582*
OnLine..12	0.355*	0.367*	0.461*	0.451*	0.499*	0.454*	0.471*
OnLine..13	0.400*	0.442*	0.540*	0.537*	0.508*	0.504*	0.526*
OnLine..14	0.383*	0.483*	0.510*	0.530*	0.534*	0.495*	0.514*
OnLine..15	0.338*	0.371*	0.455*	0.444*	0.444*	0.417*	0.434*
OnLine..16	0.346*	0.431*	0.500*	0.520*	0.493*	0.512*	0.485*
OnLine..17	0.121*	0.172*	0.262*	0.288*	0.279*	0.292*	0.270*
OnLine..18	0.211*	0.256*	0.363*	0.301*	0.316*	0.352*	0.348*

OnLine..19	0.072	0.101*	0.169*	0.144*	0.174*	0.196*	0.192*
OnLine..20	0.412*	0.431*	0.426*	0.475*	0.444*	0.471*	0.437*
Online..21	0.337*	0.397*	0.385*	0.424*	0.399*	0.416*	0.403*
OnLine..22	0.355*	0.377*	0.382*	0.450*	0.389*	0.429*	0.416*
OnLine..23	0.408*	0.468*	0.529*	0.603*	0.547*	0.575*	0.569*
OnLine..24	0.454*	0.445*	0.536*	0.496*	0.478*	0.478*	0.481*
OnLine..25	0.382*	0.388*	0.434*	0.462*	0.462*	0.464*	0.465*
Online..26	0.466*	0.464*	0.577*	0.608*	0.607*	0.565*	0.591*

	On Line..8	On Line..9	OnLine..10	OnLine..11	OnLine..12	OnLine..13	OnLine..14
OnLine..8	1						
OnLine..9	0.356*	1					
OnLine..10	0.266*	0.083	1				
OnLine..11	0.547*	0.303*	0.419*	1			
OnLine..12	0.530*	0.352*	0.239*	0.545*	1		
OnLine..13	0.640*	0.279*	0.289*	0.599*	0.678*	1	
OnLine..14	0.602*	0.273*	0.224*	0.591*	0.610*	0.718*	1
OnLine..15	0.492*	0.369*	0.257*	0.465*	0.582*	0.580*	0.613*

OnLine..16	0.572*	0.341*	0.178*	0.487*	0.583*	0.682*	0.727*
OnLine..17	0.257*	0.421*	-0.186*	0.252*	0.336*	0.304*	0.315*
OnLine..18	0.444*	0.273*	0.162*	0.265*	0.523*	0.515*	0.463*
OnLine..19	0.150*	0.263*	0.020	0.139*	0.161*	0.106*	0.119*
OnLine..20	0.406*	0.105*	0.419*	0.410*	0.276*	0.354*	0.305*
OnLine..21	0.357*	0.116*	0.422*	0.364*	0.247*	0.345*	0.280*
Online..22	0.359*	0.055	0.312*	0.345*	0.261*	0.348*	0.348*
OnLine..23	0.531*	0.196*	0.273*	0.484*	0.392*	0.450*	0.423*
OnLine..24	0.503*	0.152*	0.317*	0.465*	0.392*	0.511*	0.539*
OnLine..25	0.516*	0.239*	0.249*	0.518*	0.484*	0.531*	0.519*
Online..26	0.547*	0.254*	0.323*	0.569*	0.398*	0.518*	0.464*

	Online..15	Online..16	Online..17	Online..18	Online..19	Online..20	Online..21
Online..15	1						
Online..16	0.612*	1					
Online..17	0.342*	0.367*	1				
Online..18	0.492*	0.612*	0.274*	1			
Online..19	0.123*	0.144*	0.308*	0.065	1		

Online..20	0.253*	0.244*	0.010	0.142*	0.132*	1	
Online..21	0.251*	0.229*	0.043	0.120*	0.138*	0.769*	1
Online..22	0.319*	0.294*	0.018	0.147*	0.124*	0.661*	0.663*
Online..23	0.338*	0.386*	0.167*	0.252*	0.141*	0.553*	0.575*
Online..24	0.394*	0.468*	0.117*	0.328*	0.125*	0.402*	0.485*
Online..25	0.441*	0.467*	0.176*	0.327*	0.176*	0.411*	0.447*
Online..26	0.382*	0.458*	0.216*	0.336*	0.196*	0.487*	0.454*

	Online..22	Online..23	Online..24	Online..25	Online..26
Online..22	1				
Online..23	0.551*	1			
Online..24	0.433*	0.645*	1		
Online..25	0.390*	0.637*	0.743*	1	
Online..26	0.445*	0.622*	0.638*	0.678*	1

*

Table 67: Reliability statistics

Item	No. of observations	Sign	Item-test correlation	Item-rest correlation	Alpha
Online_access1	407	+	0.642	0.608	0.940
Online_access2	405	+	0.693	0.664	0.940
Online_access3	406	+	0.791	0.771	0.939
Online_access4	406	+	0.806	0.786	0.938
Online_access5	407	+	0.789	0.767	0.938
Online_access6	406	+	0.788	0.765	0.938
Online_access7	404	+	0.793	0.772	0.938
Online_access8	407	+	0.776	0.753	0.939
Online_access9	409	+	0.431	0.376	0.943
Online_access10	409	+	0.449	0.387	0.944
Online_access11	409	+	0.734	0.702	0.939
Online_access12	402	+	0.675	0.642	0.940
Online_access13	409	+	0.749	0.724	0.939

Online_access14	407	+	0.729	0.702	0.939
Online_access15	406	+	0.656	0.620	0.940
Online_access16	409	+	0.704	0.671	0.939
Online_access17	409	+	0.377	0.307	0.945
Online_access18	406	+	0.509	0.469	0.942
Online_access19	408	+	0.282	0.222	0.945
Online_access20	407	+	0.624	0.581	0.941
Online_access21	408	+	0.601	0.553	0.941
Online_access22	408	+	0.594	0.540	0.942
Online_access23	407	+	0.726	0.693	0.939
Online_access24	408	+	0.702	0.671	0.939
Online_access25	407	+	0.700	0.671	0.940
Online_access26	405	+	0.751	0.724	0.939
Test scale					0.942

Table 68: Reliability statistics of the support construct
Correlation matrix

	Support 1	Support 2	Support 3	Support 4	Support 5
Support 1	1				
Support 2	0.456*	1			
Support 3	0.496*	0.158*	1		
Support 4	0.613*	0.571*	0.321*	1	
Support 5	0.641*	0.655*	0.234*	0.770*	1

Table 69: Reliability statistics

Item	No. of observations	Sign	Item-test correlation	Item-rest correlation	Alpha
Support 1	408	+	0.810	0.704	0.773
Support 2	407	+	0.773	0.582	0.809
Support 3	409	+	0.532	0.340	0.860
Support 4	407	+	0.853	0.750	0.754
Support 5	405	+	0.870	0.772	0.746
Test score					0.827

Table 70: Bartlett test

Variable	Bartlett test of sphericity			Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)
	Chi-square	df	Prob>Chi.sq.	
Gender Inequalities	478.702	15	0.000	0.702
Financial constraints	267.589	3	0.000	0.636
Government Constraints	1313.289	45	0.000	0.778
Skills Constraints	840.987	10	0.000	0.821
Own fear	0.128	1	0.721	0.500
Overall/Total Constraints	4352.279	325	0.000	0.887
OnLine Acess	6986.963	325	0.000	0.943
Support	960.798	10	0.000	0.772

Table 71: Factor loadings (pattern matrix) and unique variances

Variable	Factor1	Factor2	Uniqueness
Gender_inequality1	-0.4834	0.5051	0.5112
Gender_inequality2		0.4852	0.6942
Gender_inequality3		0.4929	0.7342
Gender_inequality4		0.5597	0.6785
Gender_inequality5	0.6668		0.5547
Gender_inequality6	0.7640		0.3835
Financial_constraint1		0.6749	0.5439
Financial_constraint2	0.5257	0.4298	0.5389
Financial_constraint3	0.5701	0.4416	0.4800
Government_constraint1	0.7393		0.4017
Government_constraint2		0.4991	0.7082
Government_constraint3	0.3415		0.8287
Government_constraint4	0.4010	0.4850	0.6039
Government_constraint5			0.8956
Government_constraint6	0.7132		0.4910
Government_constraint7	0.6947		0.4996
Government_constraint8	0.7215		0.4348
Government_constraint9	0.7119	-0.4071	0.3274
Government_constraint10	0.6471		0.5800
Skills_constraint1	0.7354		0.4368
Skills_constraint2	0.6301		0.5904
Skills_constraint3	0.6675		0.5421
Skills_constraint4	0.6900		0.5231
Skills_constraint5	0.8021		0.3540

Note: Blanks represent a bs(loading)<.3

Table 72: Factor loading variable, lebel and loadings

Variable	Label	Loadings
Gender Constraint (factor 1)		
Gender_inequality1	There is gender inequality in business	0.5051
Gender_inequality2	Being a woman is a negative factor in business	0.4852
Gender_inequality3	Customs and local culture disadvantage women to operate a business	0.4929
Gender_inequality4	It is difficult for women to access finance	0.5597
Financial_const1	High-interest rates is a constraint	0.6749
Government_const2	Access to government service is a constraint	0.4991
Government Constraint (factor2)		
Government_const1	Lack of a support network is a constraint	0.7393
Government_const3	Business registration is a constraint	0.3415
Government_const6	A bribe of government officials is a constraint	0.7132
Government_const7	Inability to obtain public tender is a constraint	0.6947
Government_const8	High transport cost is a constraint	0.7215
Government_const9	High communication cost is a constraint	0.7119
Government_const10	Lack of incubator centre is a constraint	0.6471
Gender_const5	Inability to travel because of family/ husband obligations	0.6668
Gender_const6	Sexual harassment is a constraint	0.7640
Skills_const1	Lack of education and training is a constraint	0.7354
Skills_const2	Lack of entrepreneurial skills is a constraint	0.6301
Skills_const3	Lack of management skills is a constraint	0.6675
Skills_const4	Lack of business experience is a constraint	0.6900
Skills_const5	Lack of information technology skills (e.g. Internet) is a constraint	0.8021

Table 73: Factor loadings (pattern matrix) and unique variances

OnLine Access			
Variable	Label	Loadings	Uniqueness
OnLine_Access1	I search for information on the Internet on how a woman can achieve success in business.	0.671	0.532
OnLine_Access2	I use the Internet to search how I can cope with beliefs and cultural challenge women entrepreneurs.	0.708	0.484
OnLine_Access3	I search for information on the Internet on how I can access to finance such as finding loans on good deals.	0.806	0.342
OnLine_Access4	I search for information on the Internet on where I can access finance for instance find a loan on a good deal	0.819	0.325
OnLine_Access5	I search for information on the Internet where I can get a loans with lower interest rates.	0.800	0.352
OnLine_Access6	I search for information on the Internet on how to apply successful a loan.	0.799	0.354
OnLine_Access7	I search for information on the Internet on where I can obtain loans that do not demand guarantee.	0.806	0.342
OnLine_Access8	I search networks on the Internet to find who I can collaborate with to improve my business.	0.795	0.352
OnLine_Access9	I use the Internet to access government services.	0.363	0.855
OnLine_Access10	I registered my business online.	0.437	0.795
OnLine_Access11	I search for information on the Internet on how to run a legal business and pay low taxes.	0.720	0.460
OnLine_Access12	I use the Internet to learn how business works.	0.674	0.528
OnLine_Access13	I use the Internet to learn how I can manage the business and make it succeed.	0.755	0.415
OnLine_Access14	I search new online markets to find where I can sell my products or services.	0.738	0.441
OnLine_Access15	I advertise my products or services online or on social media.	0.636	0.575
OnLine_Access16	I communicate with my networks via email to limit travel to meet face to face.	0.696	0.501
OnLine_Access17	I discuss business on a cellphone with my networks instead to travel to meet them.	0.307	0.898

OnLine_Access18	I order my stock online	0.498	0.737
OnLine_Access19	I order my stock via cellphone		0.942
OnLine_Access20	I search for information on the Internet regarding right against sexual abuse	0.624	0.603
OnLine_Access21	I search for information on the Internet regarding public health	0.585	0.652
OnLine_Access22	I search for information on the Internet regarding HIV/AIDS	0.589	0.639
OnLine_Access23	I search for information on the Internet regarding my right and punishment for giving and receiving a bribe .	0.710	0.479
OnLine_Access24	I search for information on the Internet regarding public tender and how to compete within the markets	0.702	0.495
OnLine_Access25	I search for information on the Internet on how to limit the transport cost.	0.693	0.507
Online_Access26	I search for information on the Internet on how to limit the communication cost.	0.745	0.427

R test: independent vs. saturated: chi2(10) = 963.21 Prob>chi2 = 0.000

Table 74: Factor loadings and uniqueness

Support			
Variable	Label	Loadings	Uniqueness
Support1	Government and stakeholders encourage women-owned business in Kigali to use ICT in their daily business activities.	0.764	0.308
Support2	Government and stakeholders give some ICT privileges to women entrepreneurs that male counterparts do not have.	0.667	0.434
Support3	The government gives same chance women and men entrepreneurs to access to IT & ICT products.	0.412	0.747
Support4	Chamber of women entrepreneurs and stakeholders train women entrepreneurs on how to comply with the forms concerning the business (e.g. Register a business, import and export, RRA) using the Internet.	0.826	0.243
Support5	Chamber of women entrepreneurs and stakeholder organise ICT training programme which enable women-owned business in Kigali to be more efficient and effective in doing business.	0.864	0.216

Table 75: Model fit criteria and acceptable fit interpretation

Model fit criterion	Acceptable level	Obtained value
Minimum discrepancy divided by degrees of freedom (CMIN/DF (χ^2))	>1 and < 3	**0.014**
Goodness-of-fit (GFI)	0 (no fit) to 1 (perfect fit)	-
Root-mean-square error of approximation (RMSEA)	< 0.080	0.000
Normed-Fit-Index (NFI)	0 (no fit) to 1 (perfect fit)	-
Incremental fit Index (IFI)	0 (no fit) to 1 (perfect fit)	-
p-value for test of close fit (PCLOSE)	0 (no fit) to 1 (perfect fit)	0.997
Comparative Fit Index (CFI)	0 (no fit) to 1 (perfect fit)	1.000
Parsimony comparative fit index ((PCFI)	0 (no fit) to 1 (perfect fit)	-
TLI		1.073
SRMR		.000

APPENDIX C: CONSENT LETTER- CHAMBER OF WOMEN ENTREPRENEURS

CHAMBER OF WOMEN ENTREPRENEURS

PSF FSP

Kigali, December 31, 2018 2018
Ref.: RCWE/2018//ch.040

To: Mr. Simon NSENGIMANA
Email: nsengasimon@yahoo.fr
Cape Peninsula University of Technology (CPUT)

Dear Sir,

Subject: Permission to conduct your research study

On behalf of the Rwanda Chamber of Women Entrepreneurs (RCWE/PSF), we would like to formally indicate our approval for the request to conduct a research study by Mr. Simon NSENGIMANA, a doctorate' Student at Cape Peninsula University of Technology (CPUT), South Africa.

We assure you that we will support this effort and will provide the maximum possible assistance within the limits for the successful implementation of this study.

Yours Sincerely,

Jeanne Françoise MUBILIGI
Chairperson
Chamber of Women Entrepreneurs (RCWE/PSF)

CI:

- PSF
- Cape Peninsula University of Technology (CPUT)

PRIVATE SECTOR FEDERATION. FEDERATION DU SECTEUR PRIVE – RWANDA
RWANDA CHAMBER OF WOMEN ENTREPRENEURS – CHAMBRE DES FEMMES ENTREPRENEURS
Tel : (+250) 782 898 305/ Email : samputua@rcwe.org / womenchamber.psf@gmail.com

APPENDIX D: QUESTIONNAIRE COVERING LETTER

Dear entrepreneurs

RE: Request for your participation in a survey

I am a PhD student under the supervision of Professor Visvanathan Naicker in the Department of Business and Information Administration at the Cape Peninsula University of Technology.

I would request to participate in a research study titled: The importance of Information and Communication Technology (ICT) in women-owned businesses in Kigali- Rwanda. I conduct this research with the objective to determine the importance of integration of information and communication technologies in women enterprises in Kigali- Rwanda.

I would ask you to answer all questions as best you can. Your contribution to this survey questionnaire is essential. Please sacrifice around 20 minutes to complete the questionnaire. The information you give in this survey questionnaire is strictly confidential and will be used exclusively for research purpose. For any query with regard this research, please feel free to contact me (researcher) at Tel: (+27) 83 519 3479 or Prof Visvanathan Naicker (Supervisor) at Tel: (+27) 21 460 3113. Thank you in advance for your contribution in this study.

Yours sincerely

Simon Nsengimana (Researcher)
Email: nsengasimon@yahoo.fr
Cell: (+27) 83 519 3479

Prof Visvanathan Naicker [PhD] (Supervisor)
Email: naickervi@cput.ac.za
Tel: +27 21 460 3113

APPENDIX E: PARTICIPANTS' INFORMED CONSENT FORM

Consent to contribute to the research: participant right and confidentiality

1	I understand my contribution in this survey is voluntary; I can withdraw or stop answering questions any moment I need	Yes		No	
2	I understand the responses I provide do not have anything to do with my identification				
3	I understand my right to answer the questions I am comfortable with and leave those I do not need to respond for any motive				
4	I agree with the researcher that information I give is confidential and it must be used only for research				
5	I agree with the researcher that the study cannot reveal my identity and there is no consequence associated with my participation and answers are given				
6	I understand the importance of this research, and I accept to be part of the study without any influence				

Thank you for being part of this research, your participation is highly appreciated.

Simon Nsengimana (Researcher)

Email: nsengasimon@yahoo.fr

Cell: (+27) 83 519 3479

Prof Visvanathan Naicker [PhD] (Supervisor)

Email: naickervi@cput.ac.za

Tel: +27 21 460 3113

APPENDIX F: ETHICS APPROVAL

Cape Peninsula University of Technology

P.O. Box 1906 • Bellville 7535 South Africa •Tel: +27 21 4603291 • Email: fbmsethics@cput.ac.za
Symphony Road Bellville 7535

Office of the Chairperson Research Ethics Committee	Faculty: **BUSINESS AND MANAGEMENT SCIENCES**

At a meeting of the Faculty's Research Ethics Committee on **30 April 2019**, Ethics **Approval** was granted to **Simon Nsengimana (209115572)** for research activities of **Doctor of Business & Information Administration** at Cape Peninsula University of Technology.

Title of dissertation/thesis/project:	THE IMPORTANCE OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN WOMEN-OWNED BUSINESSES IN KIGALI- RWANDA Lead Researcher/Supervisor: Prof V Naicker

Comments:

Decision: Approved

	22 July 2019
Signed: Chairperson: Research Ethics Committee	**Date**

Clearance Certificate No | 2019FOBREC687

APPENDIX G: LETTER FROM EDITOR

NERESHNEE GOVENDER COMMUNICATIONS (PTY) LTD

REGISTRATION NUMBER: 2016/369223/07

DR NERESHNEE GOVENDER (PhD)

WRITING PRACTITIONER • EDITOR • COPYWRITER • TRAINER

PhD-Management Sciences - Marketing (Media, gender and identity)

M-Tech Public Relations

B-Tech Public Relations (Cum laude)

B-Tech Journalism (Cum laude)

e-mail: neresh@ngcommunications.co.za

32 Kharwa Road
Kharwastan
Durban
4092
Cell: 084 702 25 53

13/09/2020

ATTENTION: SIMON NSENGIMANA

RE: EDITING CERTIFICATE

This serves to confirm editing of the following dissertation:

THE IMPORTANCE OF INFORMATION AND COMMUNICATION TECHNOLOGY IN WOMEN-OWNED BUSINESSES IN KIGALI, RWANDA

Thesis submitted in fulfilment of the requirements for the degree Doctorate of Commerce in Business and Information and Communication Technology: Business and Information and Communication Technology in the Faculty of Business and Management Sciences at the Cape Peninsula University of Technology

The dissertation has been edited for clarity, language and layout.

Kind regards,

Nereshnee Govender (PhD)

APPENDIX H: ORIGINALITY REPORT

ORIGINALITY REPORT

14%	%	%	%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	uir.unisa.ac.za Internet Source	6%
2	etd.cput.ac.za Internet Source	2%
3	uobrep.openrepository.com Internet Source	<1%
4	hdl.handle.net Internet Source	<1%
5	Submitted to University of Witwatersrand Student Paper	<1%
6	Submitted to University of South Africa Student Paper	<1%
7	clok.uclan.ac.uk Internet Source	<1%
8	Submitted to Multimedia University Student Paper	<1%
9	mafiadoc.com Internet Source	<1%