

Internet Usage for Women Entrepreneurship Sustainability: A Study of Selected Rural Woman Entrepreneurs of Small Businesses

Roselida Maroko Ongare^[1], Anselemo Peters Ikoha^[2], Franklin Wabwoba^[3]
^{[1],[2],[3]} Department of Information Technology, Kibabii University - Bungoma Kenya

ABSTRACT

Sustaining technologies and innovations are important driving forces behind the modern day businesses and the working space. These technologies enable businesses to improve their products and services in a way that makes them compete with competitors in the same marketplace. The Internet is a sustaining technology that is currently altering the economic, social and political landscapes by changing the way people live, do business and work. The Internet if used properly can provide effective tools and services to support sustainable entrepreneurship with the potential of empowering women entrepreneurs economically, socially as well as contributing to environmental conservation and protection. This study sought to analyse Internet usage by women entrepreneurs of small businesses in rural areas. The study was premised on the fact that maximum utilization of the Internet by women entrepreneurs of small businesses in rural areas would provide opportunities to accelerate the country's social, economic and environment well-being. The study initially sought to predict the relationship between usage of Internet and sustainable development of women entrepreneurs of small businesses, then explored the detailed views of these women concerning the use of the Internet and finally compared the relationship between its usage and entrepreneurship sustainability. The findings show that Internet usage has positive and significant effect on entrepreneurship sustainability of women entrepreneurs of small businesses studied. The target population was women entrepreneurs of small businesses in Siaya County. A sample size was 272 and a response rate of 91.91% was achieved. Simple random sampling and snowball sampling techniques were used to aid in data collection. Survey research design was used and questionnaires were used to collect data. Data analysis was done using PLS-SEM statistical model and descriptive, inferential and predictive statistics that encompassed regression and correlation were used to analyse the data. Ethical issues arising from the research such as informed voluntary consent, no harm to participants, confidentiality of information and data integrity were accounted for. The reliability of the research tool was arrived at using composite reliability test and Cronbach's Alpha test. Validity of the research instrument was assessed using factor analysis. The significance of the study lies in its ability to provide valuable insights into the aspects of Internet usage in business and entrepreneurship sustainability.

Keywords — Internet, Sustainable Entrepreneurship, Women Entrepreneurs, Small Businesses

I. INTRODUCTION

Disruptive and sustaining technologies and innovations are important driving forces behind the modern day business and the working space. Whereas disruptive technology and innovation strives to create new products and markets and demonstrate a new value for a product or service the customers didn't know they either needed or were missing, sustaining technology and innovation on the other hand, is concerned with developments and improvements of products and services within established markets by improving and making them better. Thus, sustaining technology and innovations enables businesses improve their products and services in a way that makes them compete with competitors in the same marketplace. The Internet is both disruptive and sustaining technology that is currently altering the economic, social and political landscapes by changing the way people live, do business and work. [1] confirm that the Internet usage is key to economic and social growth and development in developing countries Kenya. Therefore, business organizations have to be careful to keep up with the pace of

new developments, adapt to changes, innovations and improvements in order to remain relevant and competitive in an ever changing world.

The Internet if used properly can provide effective tools to support all types of entrepreneurial activities. The Internet has become indispensable to develop business and increase competitiveness [2]. This has become possible because of high penetration of both mobile phones and the Internet globally as well as increased affordability of Internet services. According to [3] report, there were 4.1 billion Internet users in 2019, indicating an increase of 5.3% from 2018 usage figures. The report also indicates that the global penetration rate has been increasing steadily since 2005 with 17% in 2005 to above 53% in 2019. This has resulted into an increase in the number of Internet users with an average of 10 % per year between 2005 and 2019. Mobile-cellular and fixed broadband subscriptions have continued to grow with the former growing at a faster rate than the latter resulting into increased rate of penetration of mobile phones in developing countries. Increased mobile phones penetration rate together with the increased affordability of Internet

services have brought about remarkable opportunities for entrepreneurs to use both the disruptive and sustaining technologies and innovations to start and grow businesses.

It is evident that the Internet has worked a thorough revolution in the 21st century and its impact on day to day lives has grown exponentially over the past decade [4]. Internet usage has the potentials to increase social development, economic prosperity, environmental protection as well as development of new technologies that can bring out the best of the society [5] [6]. Furthermore, the Internet helps connect the world and acts as a portal to enormous amounts of knowledge which can be easily accessed and used to enhance business productivity. The Internet also makes real-time and instant communication easy, faster and affordable. Subsequently, the Internet has created a virtual community in which people can communicate with others across the world irrespective of their location.

The Internet has become an indispensable platform for economic development, innovation, creativity, communication and social inclusion. Since the Internet provides means of communication, creativity and innovation that were not available in the past, it has the potentials to transform how businesses are conducted as well as offering novel ways of addressing business development challenges [7]. Since the Internet became commercially available in the 1990s, it has enabled the development of new technologies and improvement of existing technologies which have consequently lead to new products and services, improved economic productivity, increased access to information as well as facilitating better collaboration between businesses and their suppliers and customers. The growth of the Internet has been key to the emerging information society and digital economy thus affecting both developed as well as developing countries.

Internet technologies offer immense benefits to the business community. The ubiquity and affordability of the Internet offers businesses with an unmatched opportunity to improve their social and economic development status as well as positively impacting lives [8]. With technological advancement, network coverage is growing stronger, advanced features are being incorporated in mobile phones, mobile phones becoming cheaper and Internet usage in business growing. Given the ubiquity of the Internet and Internet services, Internet technology can help bridge knowledge and gender gaps, alleviate poverty, enhance social inclusion as well as help protect the environment. There are many different Internet technologies and Internet services that affect different phases of entrepreneurship. The Internet have become indispensable tools of today's businesses subsequently, it is vital that women entrepreneurs of small businesses in rural areas keep up with their use for business productivity and competitiveness. The Internet has the ability to bridge connectivity gaps, gender gaps, distance gaps and class gaps by connecting businesses to suppliers, customers, partners and employees in a unified manner. This can help in providing a range of services to businesses and

their customers who were earlier not capable of accessing them either due to financial or location constraints. In addition, ubiquity of the Internet helps businesses in all aspects such as marketing, staff management, financial management and customer relationship management conveniently, effectively and cheaply. Because of their unparalleled benefits, women entrepreneurs of small businesses in rural areas should make the Internet usage part and parcel of their businesses for equitable business growth and development. There is also need to establish a deeper and broader understanding of how the Internet and can be used by entrepreneurs of small businesses in rural areas to enhance sustainable entrepreneurship.

The Internet penetration worldwide is impressive and promising for entrepreneurship sustainability, however, noticeable disparities still exist between various regions as well as groups. [3] report indicates that about 53.6% of the world's population use the Internet and the figure is growing every year, however, the report discovered serious geographic and economic disparities in Internet users. According to the report, there were approximately 87% Internet users in developed countries compared to only 19% in Least Developed Countries (LDC) in 2019. Africa and South Asia reportedly had the highest proportion of people not using the Internet. In addition, the proportion of women using the Internet globally was 42% compared to 58 per cent of men making the global Internet user gap stand at 16%. Although the Internet gender gap was smaller in developed countries and larger in developing countries, in all regions of the world more men were using the Internet compared to women. This gap is wider and is still growing in Arab States, Asia and the Pacific, and Africa. Regardless of all the high Internet penetration and the unparalleled potential benefits of the Internet its services many entrepreneurs including those in rural areas with high Internet penetration do not use them to the maximum.

Though the internet access across rural areas of Kenya is increasing due to improvements in infrastructure and the availability of cheap mobile phone, notable shortcomings in Internet usage still exist. Internet access and affordability remain big challenges to most entrepreneurs of small businesses in rural areas. Even though a big percentage of Kenya is covered by 3G and to some extent 4G Internet services, these signals not extend to many parts of rural Kenya making it impossible for entrepreneurs to make maximum use of these services. Furthermore, majority of the Internet user access the Internet through their mobile phones making accessibility very expensive due to high cost of data bundles. The Internet gender gap present another challenge for women entrepreneurs of small businesses in rural area as fewer women compared men use the Internet [3]. Other challenges include lack of Internet access, lack of ICT skills, lack of awareness, lack of trust and inadequate infrastructure often coupled with the high costs of connectivity in rural areas. All these challenges inhibit many women

entrepreneurs from fully benefiting from the use of Internet services.

A. Need for increased usage of Internet in business by women entrepreneurs of small businesses

Women-run businesses are on the rise globally and apparently most of them are small businesses. Small businesses form a substantial percentage of the socio-economic engine that accelerates social and economic growth and development for nations across the world [9]. These businesses are helping women entrepreneurs change their economic and social status as well as that of the society. Since, women entrepreneurs of small businesses have to striving for a balance between business and family responsibilities, for them to compete favourably in the business arena and to avoid business failure, they must adopt strategies that not only aim to increase chances of survival but enhance business sustainability. One way of doing this is to use Internet in their businesses. UN Women [10] and Alton [11] laud the role technology plays in making business growth accessible as well as speeding up global gender equality thereby making technology a key focus in women's innovation strategy.

Because of commendable contribution of technology towards environmental, social and economic development, many world governments and International organizations such as UNESCO and SIDA are promoting women entrepreneurship and sustainable economic stability in rural areas by empowering them with the necessary digital skills. Technologies that have been lauded as contributors to economic growth and development to entrepreneurs and small business owners across the globe include the Internet and its technologies and tools such mobile phones, tablets, and cloud-based services including social media platform services. These technologies, services and tools have made it easier for entrepreneurs and small business owners worldwide to start and grow sustainable businesses hence and enabling them to compete on a more levelled ground [11]. Additionally, these technologies and tools have made it easier for women entrepreneurs to strike a balance between family responsibilities and keeping their businesses growing. The Internet and its technologies in this regard can be lauded as technologies, tools and services that have brought the world closer to homemakers. The Internet being one of the disruptive and sustaining and innovation technologies has been narrowing various barriers between developing and developed nations, rural and urban, men and women as well geographical boundaries, consequently connecting businesses with suppliers, partners and customers beyond their geographical regions. Moreover, the Internet provides a repository of valuable information and knowledge for women entrepreneurs necessary for running and sustaining their businesses in a knowledge based society. Availability and accessibility of the Internet as well as affordability of mobile devices to the rural population have been essential for scaling

up information thus making it easier for women entrepreneurs to thrive [12]. Furthermore, the Internet provides a platform for e-commerce that has made it possible for women entrepreneurs to expand their customer base beyond regional boundaries by having access to virtual marketplaces thus making it much easier to manage family responsibilities and economic activities concurrently. Additionally, web-based commerce and the ability to access the Internet via mobile devices have opened up totally new global markets where women entrepreneurs can sell and buy products/services through online portals to customers all over the world [11] making mobile phones and digital platforms valuable for entrepreneurship development. Through these technologies, platforms and tools, women entrepreneurs of small businesses can connect to local and global markets, enhance communication services, accelerate customer relationship management services and enhance their creativity and innovation skills.

In the present day, banking and payment services are much easier for businesses although many rural businesses still operate in areas where banking services are limited. However, with ubiquitous Internet, mobile phones and tablets, mobile banking and mobile money transactions have had powerful and positive impacts on businesses in rural areas. Online banking and other digital financial transactions have overcome social customs and household tasks that often prevent women entrepreneurs from traveling to suppliers or banks in towns or markets centres located far away. The Internet has made business financial transactions more flexible, faster and trackable as well as lowering mobility barriers. Consequently, women entrepreneurs of small businesses have better access to the marketplaces, financial banks and institutions which they do at the comfort of either their businesses or homes [13] [14].

B. Internet Usage as a Catalyst for Entrepreneurship sustainability

Sustainable entrepreneurship also known as sustainability entrepreneurship has been defined by many authors among them, Schaltegger and Wagner [15] and Shepherd and Patzelt [16] who define sustainable entrepreneurship as innovation, creation, and taking advantage of business opportunities that contribute to sustainability by generating economic, social and environmental gains for self and others in society. The aim of sustainable entrepreneurship is to create positive economic, social and environmental impact by preserving the current resources for the future generations. Subsequently, sustainable entrepreneurship has the consequences of considering economic, social and environmental factors when making business decision to satisfy the businesses' stakeholders. Many research studies have been conducted on entrepreneurship sustainability, though [17] posit that most of these studies have concentrated on those in the cities and towns leaving out those in the rural areas. Since businesses

interact with the environment differently, there is need for research studies targeting businesses in rural areas [18].

Several entrepreneurship sustainability factors for small business have been identified by previous research studies. These include but not limited to marketing support, business networking [19] and Internet marketing [20]. Internet marketing is a powerful business sustainability factor because influences way customers' purchasing decisions. In addition, Internet marketing enables a business to build customers base through regular and low-cost personalized communication. Apparently, many customers use the Internet to research on products and their prices before making final purchase decisions. However, despite Internet usage being powerful catalysts for business processes and marketing, many small rural businesses are still lagging behind in their usage in their businesses [20].

Findings of research study carried out by Mohamad and Chin [18] on the "Effects of Internet Usage on Business Sustainability of Small Technology-based Rural Business in Malaysia" shows that Internet usage has a positive and significant effect on business sustainability. This is supported by findings of previous studies' findings that reported positive and significant impact of Internet marketing on small business performance [20] [21]. Therefore, Internet usage in business can assist women entrepreneurs in rural areas reach customers beyond their geographical locations. However, to be competent in Internet usage, they need to have the digital skills. This is supported by Radzi et al. [22] who posit that technology competencies are among the most important success factors for technology based rural businesses. Consequently, those with Internet usage competencies have higher chances of growing their businesses. This study sought to analyse Internet usage by women entrepreneurs of small businesses in a bid to identify success factors necessary for entrepreneurship sustainability.

C. Theoretical Framework

The study extend gratifications of Internet usage as proposed by Stafford et al. [23] who identified three gratifications for Internet usage i.e. content, process and social and Song et al. [24] who identified seven gratifications of Internet usage i.e. information seeking, aesthetic experience, monetary compensation, diversion, personal status, relationship maintenance, and virtual community. The study has identified nine gratifications of using Internet in business. These gratifications are communication, marketing, market research, customer relationship, purchases, sales, Internet banking, mobile money services and online meeting.

II. RESEARCH METHODOLOGY

The study adopted survey research design approach by collecting data from 272 sampled women entrepreneurs of small businesses in rural market centres across Siaya County, Kenya. Market centres were selected using simple random technique while the respondents were selected using snowballing sampling techniques. Data was collected from

the respondents using questionnaires. Data was quantitatively analysed using WarpPLS – SEM 7.0 for descriptive, inferential and predictive statistics.

A. Data Analysis

Data analysis involves inspecting, cleaning, transforming and modelling data in order to discover useful but otherwise hidden information, suggest conclusion and support decision making. Data was collected using five point Likert ordinal ranked data questionnaire. To prepare the data collected for analysis, data was cleansed and cleaned and missing values identified. The data was then coded and entered in MS Excel and PLS-SEM in readiness for analysis. Data was then analysed for significant information using descriptive, inferential and predictive statistics. Descriptive statistics are measurements used to summarize data in a systematic way by describing the relationship between variables in the study [25]. Descriptive statistics were analysed first before making inferential statistical comparisons and prediction. Descriptive statistics such as frequencies and percentages were presented in table forms and charts. Measures of central tendencies such as mean was used to describe the characteristics of collected data as well as answering research questions. Inferential statistics such as correlation analysis and regression analysis were done to analyse the relationships between the dependent variable; sustainable development of women entrepreneurs of small businesses and the independent variable; Internet usage. Inferential statistics encompass using descriptive statistics for a sample population to make conclusions or approximations about the value of a corresponding population parameter [26]. Predictive statistics which are statistical inferences connecting future observations to the given observations were done to Internet usage in business would predict future usage of Internet in business for entrepreneurship sustainability.

III. RESULTS AND DISCUSSIONS

A. Introduction

The study aimed at analysing Internet usage by women entrepreneurs of small businesses in rural Kenya for entrepreneurship sustainability. To help understand factors that could influence Internet usage for business sustainability, data about the following constructs were collected from the respondents; age of the respondent, education level, type of business, number of years in business, type of Internet connection, frequency of Internet usage in business, barriers to effective usage of the Internet, Internet usage to support business functions and Internet usage in business as a predictor of sustainable development of women entrepreneurs of small businesses. Data collected from 200 women entrepreneurs were analysed and the findings are shown and discussed below.

Findings show that out of 200 respondents, only 22 (11.0%) did not use Internet in their businesses while 178

(89.0%) used Internet in their businesses. This could be attributed to high penetration of cellular networks and mobile phones across the country which is by research findings of Kemp [27] that reported that by January 2020, 52.06 million people in Kenya had mobile connections compared to 4.2 million the same time in 2019; an increase of more than 8.7%. Subsequently, the number of mobile users in Kenya in January 2020 was the same as 98% of the total population suggesting that many users have more than one mobile phone.

B. Age range of respondents

The findings about the age bracket of the respondents show that the majority were aged between 26 and 35 years followed closely by those between 36 and 45 years. The least were those aged above 65 years followed by those aged between 56 and 65 years. This indicates that most of the women entrepreneurs of small businesses in rural Internet users aged between 26 and 35 years followed by those aged between 36 and 45 years. These results are comparable to Kenton [28] findings that indicate that the majority of Internet users in 2019 were between 25 and 35 years old. Therefore, any initiative or program intended to enhance the digital skills should target more on 25 to 45 age bracket.

Table 1. Age range of the respondents

Age Range (years)	Frequency	Percentage
Less than 26	16	8.0
26 – 35	67	33.5
36 – 45	60	30.0
46 – 55	38	19.0
56 – 65	17	8.5
Above 65	2	1.0
Total	200	100.0

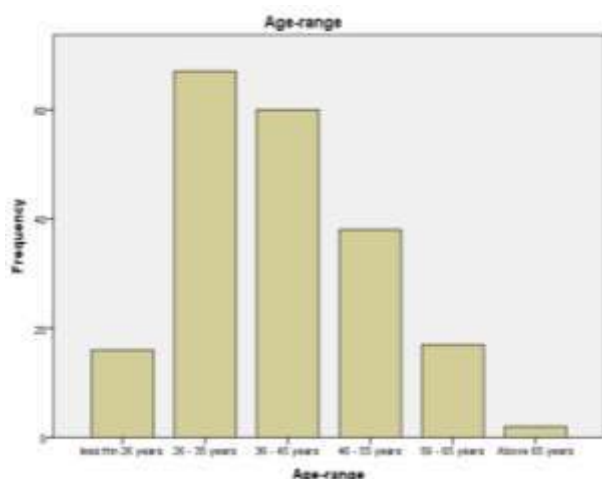


Fig. 1. Age range of the respondents

C. Education level of respondents

The findings about the level of education of the respondents as presented in Table 2 and Fig. 2 show that majority of the respondents were secondary school graduates without any post-secondary school training followed by certificate level graduates. This is indication that these women lack digital and entrepreneurship skills vital for entrepreneurship sustainability mainly taught at certificate level and above.

Table 2. Education level of respondents

Education Level	Frequency	Percentage
Primary	33	16.5
Secondary	53	26.5
Certificate	46	23.0
Diploma	39	19.5
Undergraduate	27	13.5
Postgraduate	2	1.0
Total	200	100.0

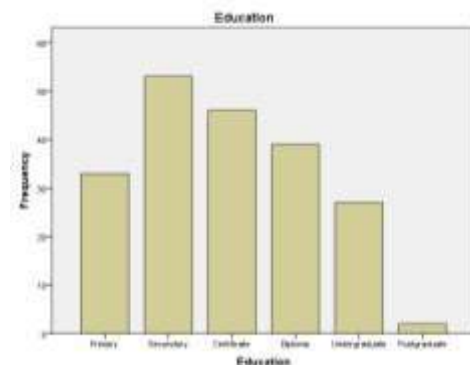


Fig. 2. Education level of respondents

D. Number of years in business

To find out how long a respondent had been in business, data about the number of years in business was collected from the respondents. The findings show that majority of the respondents had been in that particular business for between 1 and 5 years which could mean that many small businesses in rural areas fail within the first 5 years and indication that the level of business sustainability is very low. This supported by Kenton [29] who posits that 20% fail in the first year of operation, 50% fail between two to five years' operation, and only 33% reach ten years and above and Deane [30] who posits that about 20% of new businesses fail during the first two years of operation, 45% during the first five years, 65% during the first 10 years and only 25% of new businesses make it to 15 years or more. Running a sustainable business is both difficult and risky, hence all entrepreneurs must have the ability to alleviate specific risks, possess entrepreneurship skills and other relevant skills such as digital literacy skills which are important for business

sustainability. The rate of business failure could be enhanced by increased and sensible usage of Internet in businesses.

Table 3. Numbers of years in operation

Year in Operation	Frequency	Percentage
Below 1 year	22	11.0
1 - 5 years	79	39.5
6 - 10 years	37	18.5
11 - 15 years	27	13.5
16 - 20 years	15	7.5
21 - 25 years	15	7.5
26 - 30 years	3	1.5
Above 30 years	2	1.0
Total	200	100.0

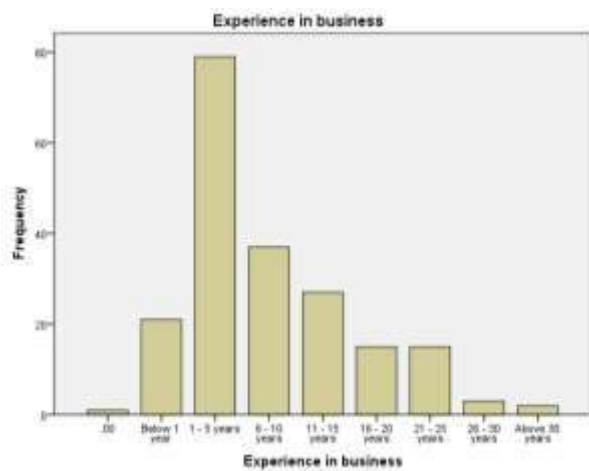


Fig. 3. Number of years in operation

E. Internet Connectivity

The findings about the type of Internet connection show that majority of the respondents accessed the Internet through their mobile phones. This can be attributed to high penetration of mobile networks and mobile phones across the country. However, this poses a challenge to Internet usage in business as this calls for constant purchase of data bundles which is very costly at the moment.

Table 4. Internet Connectivity

Internet Connectivity	Frequency	Percentage
No Internet	14	7.0
Cable	8	4.0
Cellular	178	89.0
Total	200	100.0

F. Internet usage in business

Regardless of the findings showing that the majority of the respondents have access to the Internet and use it in their businesses, the level of usage was exceptionally very low. More than half of those who used Internet in their

businesses, 58.4% (N=104) either rarely or occasionally used it. This indicates that majority of the respondents have not taken Internet usage in their businesses seriously. This could be as a result of lack of awareness of the unparalleled benefits of Internet usage in business, unreliable Internet connection, lack of digital skills and high cost of Internet access that were cited by the respondents as barriers to effective use of Internet in business. High costs of access could be attributed to high costs of data bundles as most the respondents access the Internet through mobile phones. This calls for frequent purchase of data bundles which at the moment is not affordable and sustainable to the majority of rural entrepreneurs. Additionally, lack of digital literacy is because most of the respondents lacked post-secondary school training where digital literacy and entrepreneurship skills are acquired.

Table 5. Frequency of Internet access

Frequency of Internet Usage	Frequency	Percentage
Never	22	11.0
Seldom	42	21.0
Sometimes	62	31.0
Mostly	59	29.5
Always	15	7.5
Total	200	100.0

G. Barriers to Internet Usage in Business

To understand why most of the respondents were not using the Internet maximally in their businesses, the study sought to discover the barriers that hindered effective Internet usage in businesses.

Table 6. Barriers to effective usage of internet in Business

Barrier	Frequency	Percentage
Lack of Electricity	2	0.4
Unreliable Internet Connectivity	78	16.0
Poor Internet Coverage	71	14.6
Lack of Internet coverage	13	2.7
High cost of Internet access	114	23.5
High cost of Internet devices	46	9.5
Lack of awareness	70	14.4
Lack of digital skills	71	14.6
Language barrier	14	2.9
Lack of security	7	1.4
Total		100.0

The findings show that electricity, language barrier, and security are not barriers to Internet usage in business.

This can be attributed to increased coverage by electricity in rural areas as a result of rural electrification program the Government financed to a tune of 2.7 billion Kenya shillings. This program is one of the Kenya Vision2030 programs that aim to enable the country to achieve middle-income status by 2030. Additionally, Kenya has abundant renewable energy (RE) potential, particularly solar energy hence the upsurge of solar power consumption in rural areas not served by electric power grid could have contributed to enough power supply in rural parts of Kenya. Language is also not a barrier to Internet usage in business and the main factor that may have influenced this positive trend in Kenya is the use of the English language as the official language. Although online businesses and Internet users are prone to attacks from scammers and gamblers, many entrepreneurs did not consider Internet usage as a threat. Compared to the Internet's contribution to business sustainability, most users are not very keen on security or are unknowledgeable about the possible risks associated with Internet access. However, for maximum benefits from Internet usage in business, entrepreneurs need knowledge about secure use of the Internet.

Findings also show that cost of Internet access, cost of access devices, lack of awareness, lack of digital literacy, unreliable Internet connectivity and poor network coverage are barriers to effective usage of Internet in business. The major barrier is the cost of Internet access. The cost of Internet access in Kenya remains expensive with most people spending a large percentage of their earnings to purchase data bundles. This is attributed to the high cost of lack of a shared infrastructure that can significantly help to reduce prices because the main companies that have installed their own infrastructure such as communication masts, are meeting the cost alone. The high cost of access is definitely a major hindrance to effective usage of Internet in business and to alleviate this, the central and the county governments together with telecommunication companies should fund projects that aimed at increasing broadband access. This would help in lowering access costs as overdependence on expensive cellular networks will be alleviated. High cost of smart phones and other Internet access devices also hinder a number of entrepreneurs from effectively using the Internet in their businesses. Lack of awareness is also a barrier to effective usage of Internet in business which suggests that a number of Internet users as well as non-Internet users are ignorant of the numerous benefits that Internet use offers. Lack of digital skills is also a barrier to effective Internet usage in businesses as most of the respondents were secondary school graduates and below.

H. Internet usage to support business operations

Data about what the entrepreneurs use the Internet for and the extent in which they use it in their businesses were collected and analysed. Nine gratifications that motivate women entrepreneurs of small businesses to use Internet in their business were identified based on business operations.

These were Purchases, sales, marketing, customer relationship, communication, market research, online banking, mobile money and online meetings. The findings are presented in the following as presented in Table 7, Table 8 and discussed in the sub-section.

Table 7. Internet usage to support business functions statistics

	Billing	Selling	Marketing	Customer Relationship	Communications	Market Research	Internet Banking	Mobile Money	Online Meeting
N	280	280	280	280	280	280	280	280	280
Frequency	88	97	122	19	139	121	70	178	84
Mean	2.18	2.28	2.63	2.75	3.15	2.68	1.82	3.84	1.87
Median	1.08	1.08	1.08	1.00	4.08	1.08	1.80	4.08	1.80
Mode	1	1	1	1	4	1	1	4	1
Skewness	0.617	0.403	0.047	-0.030	-0.392	0.278	1.106	-1.468	0.913
Std. error of Skewness	0.172	0.172	0.172	0.172	0.172	0.172	0.172	0.172	0.172
Kurtosis	-1.204	-1.472	-1.402	-1.516	-1.402	-1.420	-0.253	1.571	-0.621
Std. error of Kurtosis	0.342	0.342	0.342	0.342	0.342	0.342	0.342	0.342	0.342

Skewness of Internet usage is distributed as follows: Internet banking and mobile money services were highly skewed with a distribution of 1.106 and -1.468 respectively. Purchases and online meetings were moderately skewed with a distribution of 0.617 and 0.913 respectively. Sales, marketing, customer relationship, communication, and market research services were approximately skewed with 0.403, 0.047, -0.030, -0.392 and 0.250 respectively.

All the kurtosis values were Platykurtic which means that their kurtosis was less than three (kurtosis < 3). This is an indication of no outliers because the extreme values were less than that of the normal distribution. Kurtosis values for Internet usage for purchases, marketing, customer relationship, communication, market research, Internet banking, mobile money and online meeting were -1.204, -1.472, -1.516, -1.402, -1.420, -0.253, 1.571 and -0.621 respectively.

The usage of the Internet to support the nine business functions percentages and ranks were as presented in the table below.

Table 8. Internet usage to support business functions frequencies

Business Function	Frequency	Contributions	Ranking
Sales	88	0.096	6
Purchases	97	0.106	5
Marketing	122	0.133	3
CRM Services	19	0.021	9
Communication	139	0.151	2
Market Research	121	0.132	4
Internet Banking	70	0.076	8
Mobile Money Services	178	0.194	1
Online Meetings	84	0.092	7

The findings show that Internet usage in business distribution was as follows: Mobile money service was

position one with 178 users (0.194). Communication service was position two with 139 users (0.151). Marketing was position three with 122 users (0.133). Market research was position four with 121 users (0.132). Purchases was position five with 97 users (0.106). Sales was position six with 88 users (0.096). Online meeting was position seven with 84 users (0.092). Internet banking was position eight with 70 users (0.092). Customer relationship service was position nine with only 19 users (0.021).

Mobile money service was the most popular Internet service among the respondents closely followed by communication and marketing services. This could be because these services are supported by 2G networks and all rural areas are covered at least by 2G networks. Moreover, you don't need an expensive mobile phone or one with many features to use SMS and mobile money services. The least popular service was customer relationship services followed by Internet banking and online meeting respectively.

I. Relationship between Internet usage in business and entrepreneurship sustainability

The study also sought to investigate whether Internet usage in business would predict sustainable entrepreneurship of women entrepreneurs of small businesses in rural Kenya.

1) Strength of relationship between Internet usage in business and entrepreneurship sustainability

First, hypotheses were formulated and tested using the p-values as illustrated in Table 9.

First, hypotheses were formulated and tested using the p-values as illustrated in Table 9.

Table 9. Summary of Hypotheses

S/No	Hypothesis Code	Hypothesis Description	Supported/Not Supported
1.	H ₀	Internet usage in business positively predicts entrepreneurship sustainability of women entrepreneurs of small businesses in Siaya County, Kenya	Supported
2.	H _a	Internet usage does not positively predict predicts entrepreneurship sustainability of women entrepreneurs of small businesses in Siaya County, Kenya	Not Supported

The P-values and path coefficients were used to determine whether the relationship between Internet usage

and entrepreneurship sustainability was statistically significant as well as to determine the nature of the relationship. The path coefficients are used describe the mathematical relationship between an independent variable and the dependent variable while the p-values for the coefficients are used to indicate whether the relationship is statistically significant or not. This is important for generalization because the p-values determine whether the relationships that are observed in the sample population also exist in the entire population. If the p-value for a variable is less than the significance level ($p < 0.05$), then there is enough evidence that the sample data is a true representation of the entire population. This implies that the sample data favour the null hypothesis suggesting a non-zero correlation. As a result, changes in the independent variable are the cause behind the changes in the dependent variable at the population level. However, in a case where the p-value of a variable is greater than that of the significance level ($p > 0.05$), then there is insufficient evidence that the sample data is a true representation of the entire population.

In this study, the null hypothesis was accepted. The p-value was 0.014 and the path coefficient was 0.152. The sign of a regression coefficient determines whether there is a positive or negative correlation between each independent variable the dependent variable. A positive coefficient indicates that as the value of the independent variable increases, the mean of the dependent variable also increases while a negative coefficient suggests that as the independent variable increases, the dependent variable decreases. In this study the path coefficient was positive an indication that as Internet usage in business increases entrepreneurship sustainability also increases. Therefore, Internet usage in business is a positive and significant predictor of sustainable entrepreneurship of women entrepreneurs of small businesses ($p = 0.014$, $\beta = 0.152$). Thus, increases in Internet usage in business causes the mean of sustainable entrepreneurship of women entrepreneurs of small businesses also to increase.

2) Best Fitting Diagrams

The best fit diagram was used to determine the correlation or relationships between Internet usage and sustainable entrepreneurship of women entrepreneurs of small businesses. The line of best fit that roughly passes from end to end but in the middle of all the data points on the graph was generated as shown in Figure 4. Correlation is stronger if the data points are closer to the line of best fit. From Figure 4, it can be concluded that the correlation coefficient of Internet usage and entrepreneurship sustainability is positive, significant and strong.

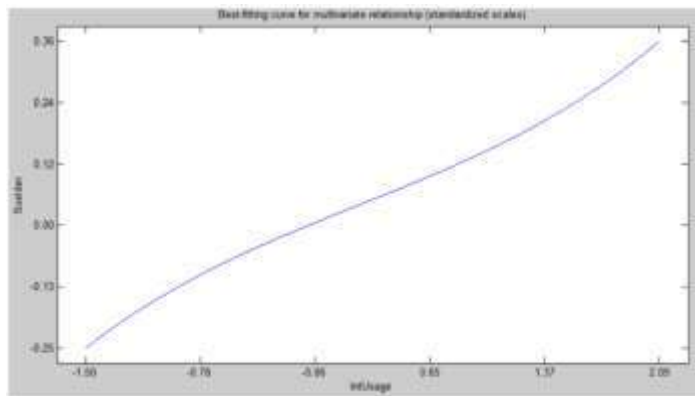


Fig. 4. Relationship between Internet usage and entrepreneurship sustainability of women entrepreneurs

It was therefore evident that the Internet is a powerful business support tool that is a catalyst for sustainable women entrepreneurship because its usage in business positively predicted entrepreneurship sustainability.

3) *The effects of Internet usage for entrepreneurship sustainability of women entrepreneurs of small businesses*

From the study, it is evident that Internet usage in business enhances entrepreneurship sustainability. The usage of Internet in business eliminates the need of frequent business travels which in turn reduces the chances of contracting communicable diseases such as COVID-19, common flus and tuberculosis (TB) therefore improving the general health of entrepreneurs and the population at large. Mobile money transfers, business communication, online meetings, digital marketing, Internet banking, sales and purchases help in reducing health related ailments and environmental stress imposed on an entrepreneur as a result of frequent travels that the business demands. Reduced need to travel also reduces environmental pollution caused by motor vehicle and motor cycle emissions and fuel spillages as well as frequent road accidents thus protecting lives. Reduced need to travel by rivers, lakes and sea helps in preventing water pollution hence ensuring safe and uncontaminated water from these water sources as well as protecting and restoring water-related ecosystem which is a SDG 2030 target.

Online meetings although not a popular service among the women entrepreneurs studied, can save time and costs spent to travel to meet suppliers, customers, business partners as well as employees. Online meetings also eliminate geographical barriers and allow entrepreneurs to communicate directly with customers, partners, employees and suppliers across the globe. Online meetings are very effective because an entrepreneur can upload slides, photos and videos of products and services and share them with the customers during the meeting. Furthermore, video-conferencing is just as effective as face-to-face meetings because of the possibility of interpretation of non-verbal

communications. In addition, online meetings also reduce generation of paper waste used for letters, memos, minutes and notes as a result of face to face meetings. In the wake of covid-19 pandemics, online meetings are vital for combating the spread of the deadly virus thus protecting the health of the entrepreneurs and their suppliers, customers, employees and partners.

Internet for business communication, digital marketing, market research and customer relationship services reduce generated waste. This is because the amount of paper used in printing cheques, posters, reports, memos, orders, assignments, notices and invoices is reduced. This leads to the conservation of trees and the environment as well as reduced costs of business operating. Conservation of trees in a region help increase high rainfall because as air passes over the trees it picks up moisture given off by the trees thus fuelling rains. Accordingly, more rains imply increased crop productivity hence better agribusiness industry and food security for the population. More rains also help in improving the lives of livestock which are important for global food security since livestock products are important agricultural commodity for food security as they provide proteins for all and contribute to the livelihood of many poor communities as well as a source of employment.

Online purchases help in reducing supplier power hence reduction in operating costs because entrepreneurs have access to several suppliers countrywide or worldwide. This gives an entrepreneur the opportunity to choose the most viable supplier which helps in lowering the costs of purchases thus decreasing operating costs.

Online sales results into expansion of markets beyond geographical boundaries because of the ability to reach customers beyond the local markets. The ability to reach global markets leads to larger customer base that leads to higher profit margins. Online sales also lead to fair competition because the customers are geographically dispersed hence local entrepreneurs do not have to compete for the same customers. Moreover, high profit margins lead to business expansion and/or investments in new business ventures which are sources of employment for the entrepreneurs as well as others in the society. Furthermore, high profits lead to improved living standards, poverty reduction and women entrepreneur empowerment because both the entrepreneur and the employees can afford basic needs such as food and access to better healthcare services for self and family. Additionally, high profit margins also enable an entrepreneur think of investments towards environmental development.

The use of Internet in business communication increases the entrepreneur and employee productivity because of reduced time needed to search for information from papers and books. Effective business communication also improves customer satisfaction and retention which is an indication of high profit. Similar to business communication, CRM services improves customer satisfaction and retention. CRM services help entrepreneurs organize customers'

information in an organized manner for the purpose of personal market campaigns as well as meeting customer needs.

IV. CONCLUSIONS

The level of Internet usage by the women entrepreneurs of small businesses studied is still very low rendering the potentials benefits of Internet usage for entrepreneurship sustainability largely untapped. Internet usage in business have unparalleled potentials to enhance women entrepreneurship sustainability hence should be encouraged and enhanced. Internet usage in business is a catalyst of entrepreneurship sustainability because business transactions become fast, cost effective and efficient hence increased productivity. In addition, Internet usage in business is vital for fast-tracking the achievements SDGs because entrepreneurship has the potentials of empowering women hence reducing inequality thus enhancing social cohesion and tackling environmental challenges as well as maintaining financial sustainable.

V. RECOMMENDATIONS

The study therefore makes the following recommendations that are vital for enhanced usage of the Internet in business and entrepreneurship sustainability of women entrepreneurs in rural areas:

1. For sustainability of women entrepreneurship, the governments should invest more in technology programs that target young women entrepreneurs below the age of 45 years because of their high rate of technology adoption.
2. To make rural areas attractive to entrepreneurs with higher education levels as well as those in manufacturing and agribusiness industries, the governments should invest in programs and projects aimed at improving the infrastructure as well as network coverage in rural areas.
3. The central and county government as well as non-governmental organizations, private sectors and well-wishers should invest in programs aimed at enhancing the digital and entrepreneurship literacy of women entrepreneurs at grass root levels.
4. To avert business failure in the first five years and increase the levels of business sustainability, women entrepreneurs should use Internet and other ICT tools to support their businesses and make them more competitive.
5. To solve the problems of network reliability and poor network coverage, the National Optic Fiber Backbone project aimed at connecting all the counties of Kenya should be fast-tracked, if the country hopes to achieve SDGs by 2030. There should also be initiatives to expand the 3G and 4G network coverage to most areas in the rural still under 2G and minimal coverage of 3G.
6. To expand broadband access to communities and markets centers around them, Universities should expand their wireless network coverage and share it with the business community and researchers through subsidized subscriptions. Additionally, to expand the level of connectivity, Universities should act as base stations to the communities around them.
7. To make Internet access affordable and to encourage Internet usage in business, central government, the county governments together with private sectors and telecommunication companies should establish data centers in major market centers across the counties where entrepreneurs can be given access upon registration at subsidized costs.
8. To increase the level Internet usage in business by women entrepreneurs of small businesses in rural areas, the Kenya Chamber of Commerce in collaboration with the Kenya business community and mobile network providers such as Safaricom, Telkom Kenya and Airtel should come up with sustainable entrepreneurship discounted bundles for small business entrepreneurs in rural areas just as KENET did to make e-learning affordable during the COVID-19 pandemic outbreak.
9. To solve the problems of lack of awareness, digital literacy as well as to provide universal access to Internet, the government's project of establishing community data center in every sub-county should be fast-tracked and extended to include busy market centers across the counties irrespective of being or not being in sub-county headquarters. Through these community data centers, the governments and telecommunication companies can jointly provide subsidized wireless Internet access to those within and around the market centers at subsidized costs.
10. Lack of entrepreneurship skills can be alleviated by setting up community data centers cum sustainable entrepreneurship hubs in every sub-county and busy rural market centers across the counties where entrepreneurs can take short literacy courses on sustainable entrepreneurship and ICT fully funded or at subsidized costs. Free and cheap online literacy tutorials can also be developed and packed as mobile apps.
11. To scale up the rate of Internet usage in business, there is need of awareness campaigns and tailored programs for digital and entrepreneurship literacy. This can be done through combined initiatives by the governments, community based organizations, private sectors and individual well-wishers.
12. Entrepreneurs should seek to supplement their offline businesses with online presence. Sales on websites attract customers beyond the local geographical boundaries. For more traffic to the business website, the link can be posted on the business's Facebook page, business's WhatsApp group, hash tagged on Twitter handle, and posted on the business's YouTube page.
13. To reduce supplier power and to purchase products at fair prices, entrepreneurs should search for potential suppliers online and make purchases both online and offline.

14. For effective, customer relationship services, entrepreneurs should make maximum use of the available free cloud based CRM solutions for small businesses or low cost cloud CRM solutions. CRM solutions are ideal for organizing customers' contact information, keeping an overview of sales performance using various metrics such as calls and sales made through customer profiles and customer segmentation for the purchase of targeted marketing. Local software developers should also be encouraged to develop affordable CRM mobile apps for entrepreneurs of small businesses.
15. For cost effective communication with suppliers, customers, partners and employees, entrepreneurs should use forums, emails, online chat and VoIP (Voice Over Internet Protocol).
16. For digital marketing, entrepreneurs with websites should intensify their search engine optimization (SEO) in order increase the quantity and quality of traffic to those sites, start a blog for the business to draw attention to the business website, build email lists for targeted and group marketing and join other community forums such as Facebook, Twitter and Instagram.
17. Entrepreneurs should invest on online market research in order to identify targeted market niches interested in their products/services, to create better products and/services and gauge their success level from points and suggestions made by the customers.
18. For online meetings with customers, suppliers, partners and employees, entrepreneurs should use video conferencing software for small businesses
19. For banking, entrepreneurs should make use of online banking services now provided by almost all banks and financial institutions. Online banking is one of the best ways to go green by saving on paper usage. Furthermore, online banking is flexible and cost saving.

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REFERENCES

- [1] Hopestone, Kayiska, Chavula.
(2013). "Telecommunications development and

economic growth in Africa". *Information Technology for Development*. [Online] 19 (1), pp. 5-23. Available. <https://www.tandfonline.com/doi/full/10.1080/02681102.2012.694794>. [December 22, 2020]

- [2] I. Martinez & T. Nguyen. "Using Information and Communication Technology to Support Women's Entrepreneurship in Central and West Asia": Internet, <https://www.adb.org/sites/default/files/publication/42466/using-ict-womens-entrepreneurship-central-west-asia.pdf>, May, 2014 [December 19, 2020]
- [3] International Telecommunication Union. "Measuring Digital Development Facts and Figures 2019": Internet, <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/FactsFigures2019.pdf>, 2019 [December 20, 2020]
- [4] A. Singh. "The Importance of Technology in Entrepreneurship": Internet, <http://www.epicentreuwindor.ca/the-importance-of-technology-in-entrepreneurship/>, July 22, 2015 [December 21, 2020]
- [5] International Telecommunication Union. "ITU Goal 10: Reduce Inequality": Internet, <http://www.itu.int/en/sustainable-world/Pages/goal10.aspx> 2017 [November 13, 2020]
- [6] C. Bommelaer de Leusse & C. Gahnberg. "The Global Internet Report: Consolidation in the Internet Economy": Internet, <https://future.internet-society.org/2019/wp-content/uploads/sites/2/2019/04/InternetSociety-GlobalInternetReport-ConsolidationintheInternetEconomy.pdf>, February 26, 2019 [November 28, 2020]
- [7] Internet Society. "The Internet and Sustainable Development": Internet, <https://www.internet-society.org/resources/doc/2015/the-internet-and-sustainable-development/>, June 5, 2015 [November 30, 2020]
- [8] S. Santosham & D. Lindsey. "Bridging the gender gap: Mobile access and usage in low and middle-income countries": Internet, https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2016/02/GSM0001_03232015_GSMARReport_NEWGRAYS-Web.pdf, 2015 [December 1, 2020]
- [9] W. B. Gillian. "Women Are Owning More and More Small Businesses. But don't celebrate just yet": Internet, <https://www.theatlantic.com/business/archive/2015/04/women-are-owning-more-and-more-small-businesses/390642/>, April 17, 2015 [November 5, 2020]
- [10] H. Molinier, A. R. Chen and E. Skogvang. "Innovation for gender equality": Internet, <https://www.unwomen.org/en/digital-library/publications/2019/03/innovation-for-gender-equality>, 2019 [November 5, 2020]

- [11] L. Alton. "How Technology Is Helping Women-Owned Businesses Around the Globe Grow": Internet. <https://community.connection.com/how-technology-is-helping-women-owned-businesses-around-the-globe-grow/>, 2019 [November 12, 2020]
- [12] A. F. Kapinga, C. S. Montero, E. R. Mbise. (2019 March). "Mobile marketing application for entrepreneurship development: Codesign with women entrepreneurs in Iringa, Tanzania". *The Electronic Journal of Information Systems in Developing Countries*. [Online] 85 (2), Available. <https://doi.org/10.1002/isd2.12073>. [November 13, 2020]
- [13] A. Demircug-Kunt, L. Klapper, D. Singer, S. Ansar & J. Hess. (2017). Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution. Washington, DC: World Bank. [Online]. Available: <https://openknowledge.worldbank.org/handle/10986/29510>. [September 14, 2020]
- [14] Organization for Economic Cooperation and Development, (2008). "Gender and Sustainable Development: Maximizing the Economic, Social and Environmental Role of Women: Internet, <https://www.oecd.org/social/40881538.pdf>, 2008 [November 15, 2020]
- [15] S. Schaltegger & M. Wagner. (2011). "Sustainable entrepreneurship and sustainability innovation: Categories and interactions. Business Strategy and the Environment" *Wiley Online Library*. [Online] 20(4), pp 222–237. <https://doi.org/10.1002/bse.682>. [October 30, 2020]
- [16] D. A. Shepherd and H. Patzelt. (2011). "The new field of sustainable entrepreneurship: Studying entrepreneurial action linking "what is to be sustained" with "what is to be developed". *Entrepreneurship Theory and Practice*. [Online] 35(1), pp 137–163. <https://journals.sagepub.com/doi/10.1111/j.1540-6520.2010.00426.x>. [November 10, 2020]
- [17] M. S. Kamunge, A. Njeru & O. I. Tirimba. (2014 December). "Factors Affecting the Performance of Small and Micro Enterprises in Limuru Town Market of Kiambu County, Kenya". *International Journal of Scientific and Research Publications*. [Online] 4(12), pp 2250–3153. <http://www.ijsrp.org/research-paper-1214.php?rp=P363437>. [November 1, 2020]
- [18] M. Mohamad and O. Chin. (2018). "The Effects of Internet Usage on Business Sustainability of Small Technology-based Rural Business in Malaysia". *International Journal of Engineering and Technology(UAE)*. [Online] 7 (4), Pp 635-638. https://www.researchgate.net/publication/330193084_The_Effects_of_Internet_Usage_on_Business_Sustainability_of_Small_Technology-based_Rural_Business_in_Malaysia
- [19] M. L. Mohd. Zin. "Determinants of Business Performance Among Rural Entrepreneur". In *E-Proceeding of the International Conference on Social Science Research, ICSSR*, 2015, pp. 114–12. <http://worldconferences.net>
- [20] N. F. Mokhtar. (2015 January). Internet Marketing Adoption by Small Business Enterprises in Malaysia". *International Journal of Business and Social Science*. [Online]. 6(1), pp 59–65. http://ijbssnet.com/journals/Vol_6_No_1_Januaryr_2015/7.pdf
- [21] A. Tarutè, R. Gatautis. (2014). "ICT impact on SMEs performance". *Procedia - Social and Behavioral Sciences*. [Online]. 110. Pp 1218-1225. 10.1016/j.sbspro.2013.12.968.
- [22] K. M. Radzi, M. Nazri & M. Nor. (2017). "The impact of internal factors on small business success: a case of small enterprises under the FELDA scheme". *Asian Academy of Management*. [Online]. 22(1), 27–55. 10.21315/aamj2017.22.1.2.
- [23] T. F. Stafford, M. R. Stafford, L. L. Schkade. (2004 April 22). "Determining Uses and Gratifications for the Internet". *Wiley Online Library*. [Online]. 35(2), pp 259-288, <https://doi.org/10.1111/j.00117315.2004.02524.x>
- [24] I. Song, R. Larose, S. Matthew, M. S. Eastin, C. A. Lin. (2004). Internet Gratifications and Internet Addiction: On the Uses and Abuses of New Media. <https://doi.org/10.1089/cpb.2004.7.384>
- [25] P. Kaur, J. Stoltzfus, V. Yellapu, "Descriptive statistics". *International Journal of Academic Medicine* [Online]. 4 (1) pp 60. <https://www.ijam-web.org/text.asp?2018/4/1/60/230853>
- [26] G. G. Benjamin, S. Kevin, M. Aaron. (2017). "Inferential statistics and the use of administrative data in US educational research". *International Journal of Research & Method in Education*. 40(2), pp 214-220, DOI: 10.1080/1743727X.2015.1113249
- [27] S. Kemp. "Digital 2020: Kenya": Internet. <https://datareportal.com/digital-in-kenya>, February 18, 2020 [December 1, 2020]
- [28] USIU Africa. "Social Media Consumption in Kenya: Trends and Practices": Internet. https://www.usiu.ac.ke/assets/file/SIMElab_Social_Media_Consumption_in_Kenya_report.pdf, 2019 [October 30, 2020]
- [29] W. Kenton. "What Is the Small Business Administration?": Internet. <https://www.investopedia.com/articles/personal-finance/120815/4-most-common-reasons-small-business-fails.asp>, 2019 [November 23, 2020]
- [30] M. T. Deane. "Top 6 Reasons New Businesses Fail": Internet. <https://www.investopedia.com/financial-edge/1010/top-6-reasons-new-businesses-fail.aspx>, 2020. [November 23, 2020]