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Evaluating Women Participation in Information and Communication Technology (ICT) among MSME's in Zambia; A Case Study of CBD, Lusaka

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ABSTRACT
The purpose of this study was to evaluate women participation in Information and Communication Technology (ICT) among Micro, Small and Medium Enterprises (MSMEs) in Zambia; a case study of the Central Business District (CBD) of Lusaka. Employing a mixed-methods research approach, the study carried out comprehensive analysis of the data sourced from questionnaires and interviews in which the respondents were females running a business in Lusaka. The findings illustrate the prevalence of women's participation in ICT, identifies the factors influencing women involvement in ICT and the strategies that can be used to promote participation among women MSMEs in ICT. The study used the Technological-Organization-Environment (TOE) framework as the conceptual framework. Using this theory, the author formulated variables under the categories; economic factors, socio-cultural factors, educational factors and the policy interventions from the government. The analysis was done using the Statistical Package for Social Sciences (SPSS) version 27. The results of the study revealed that there are few women participating in ICT domain among MSME's in Lusaka. The study further showed that 24.7% of the females operated micro enterprises while 75.3% are operating as small enterprises and none are operating as medium enterprises as per definition provided in the MSME's development policy of 2008. Some of the factors that were identified as affecting the participation of women in ICT among MSMEs according to the study include limited access to necessary equipment, lack of empowerment, and lack of public understanding of the industry by the public. The study recommended promoting STEM education among women, promoting mentorship programs and for the government to increase funding towards empowering women that want to establish businesses in the ICT sector.

Keywords: *women participation, micro, small, and medium enterprises, information and communication technology*

I. INTRODUCTION

Entrepreneurship is a crucial driver of economic growth, productivity, innovation, and employment, and is widely recognized as a key aspect of economic dynamism. Transforming ideas into viable economic opportunities remains a pivotal challenge in the realm of entrepreneurship. The ongoing digital revolution is profoundly altering the way humanity lives, works, and interacts, and the rapid growth and adoption of Information and Communications Technologies (ICTs) have the potential to improve access to information, services, and foster collective action for economic development (Kanakulya, et al., 2020). A study conducted by (Aleke, et al., 2011), revealed that in Poland, ICT investment contributed on average 0.47 of a percentage point or 8.9% of the Gross Domestic Product (GDP) growth and 12.7% or 0.65 of percentage point contribution to labor productivity between 2000-2005. The past decade has witnessed an increasing body of evidence showcasing the positive socio-economic impact of access to and utilization of ICTs, particularly in developing countries. For instance, increased mobile phone penetration in developing contexts can boost GDP by up to 1.2% for every 10% increase (Papastathopoulos & Beneki, 2010). A great number of women in developing countries, Zambia in particular, engage in running small businesses. The most valuable application of IT for women small business owner is information, accessing information to facilitate their business, generating and disseminating information about the business (Denscombe, 2014).

In the Zambia context, women entrepreneurs primarily fall into two categories: traditional and innovative. The traditional category consists of women who initiate businesses due to economic hardships at home, contributing to the push factor in the economy. On the other hand, innovative women entrepreneurs are motivated by limited career progression in large firms and display ambition and dedication towards their businesses. In Zambia, as in many other countries, the winds of digital transformation have swept across the nation, fundamentally altering the landscape of business, education, governance, and everyday life. However, despite the transformative potential of women MSMEs in ICT, a glaring gender gap persists within the

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Zambian entrepreneurial ecosystem. Women, who constitute half of the nation's population and possess a wealth of untapped potential, remain underrepresented in ICT entrepreneurial activities. According to the Zambia Business Survey (2010), male entrepreneurs accounted for 58%, while females constituted 42% of the entrepreneurial landscape. And because of this gender gap in the ICT industry, this study undertakes to evaluate the participation of women in ICT among MSMEs in Lusaka, Zambia. By doing so, the study will fill a gap in literature related to the topic and thereby provide insights for stakeholders and policy makers concerning the topic. As compared to other studies that have studied the ICT industry in Zambia, this study solely focuses on women in ICT among MSMEs in Lusaka, the business hub of the country. The findings of this study will guide the formulation of policies that enhance and promote women participation in ICT and subsequently add to the economic growth of the country.

II. LITERATURE REVIEW

The objective of literature review is to lay a theoretic framework for the study. A study done by (White, 2000:67), stated that "literature provides a study that is useful, especially when researchers lack a clear idea of the problems they will meet during the study." Noted below are some studies related to the current topic done by other scholars.

2.1 Defining ICT and ICT Entrepreneurship

A study done by (Duncombe and Heers, 2001) defined ICT as the 'electronic means of capturing, processing, storing, and disseminating information.' Studies done by ((Dube & Puneet, 2021) use the term ICT to refer to computerized systems and to advanced telecommunication systems. Advanced telecommunications systems include 'voice mail, fax technology, teleconferencing and wireless communication such as, cellular phones. (Ndhlovu, 2018) indicated that ICT umbrella term that includes all information technologies for manipulation and communication information. In principle, "ICT-Entrepreneurs" refer to any firm or business that is involved direct or indirect with any kind of ICT product and services, such as computer sales, Internet services and digital printing (Haag, Cummings & McCoubrey, 2005).

2.2 Defining MSMEs

The definition of MSMEs in Zambia is not so easy to put into context of reality because it is based on the MSME policy which was last revised in 2008. The operational environments of the majority of businesses have been impacted by numerous events during the last 16 years, some of which include the rebasing of the kwacha and modifications to other policies that been an impact on businesses directly or indirectly. However, since the definitions are based on different facets, this study uses facets of the definition that apply perfectly to the current study. To properly illustrate the definition of MSME in Zambia we consider the aid of a table 2.1 below.

Table 2.1: Definition of MSMEs

	Micro	Small	Medium
Registration with Registrar of Companies	Yes	Yes	Yes
Investment (excluding land and buildings)	K80,000	K80,000 – K200,000	K200, 000 – 500,000
Investment Services and Trading	K80,000	K150,000	K151,000 – K300,000
Turnover	K150, 000	K150,000 – K250,000	K300,000 – K80,000
Employment	1-10 workers	11-49 workers	51-100 workers

Source: The Micro, Small and Medium Enterprise Development Policy, MCTI November 2009

2.3 Women in ICT Entrepreneurship: Global Perspectives

A study by (Global Entrepreneurship Monitor, 2019) indicates that women remain underrepresented in ICT entrepreneurship. While significant progress has been made in recent years, women-owned ICT businesses are still a minority. Another global study done by (Brush, et al., 2019) indicates that access to financial resources and venture capital is a major challenge for women entrepreneurs in the ICT sector worldwide. Gender biases in investment decisions and limited access to funding networks hinder women's growth in this domain. A study by (Chang, 2013) based on interviews with women managing or working in ICT firms in Kenya revealed that the "fear of mathematics and sciences, which are important in the pursuit of technology, is a result of negative attitudes instilled in girls during socialization at home and in school." Additionally, ICT

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courses often tend to be costly and "dominated by men." Successful women in the field credited parental support, motivation, and mentorship, often from male mentors already working in ICT.

2.4 African Region Context

A study by (James et al., 2006) showed that Women entering the ICT sector in South Africa face challenges such as work-life balance issues, the undervaluation of women's contributions at work, adverse stereotypes, a lack of women role models, reentry difficulties due to the rapid pace of change in ICT, and a lack of guidance regarding career options.

2.5 Zambian Context

(Ndhlovu & Nkhoma, 2018) conducted a quantitative research study to explore the role of education in women's participation in ICT entrepreneurship in Zambia. They surveyed 200 female entrepreneurs and 50 ICT educators. The study revealed that limited access to quality ICT education posed a significant barrier, impacting women's ability to bridge the digital skills gap and succeed in ICT entrepreneurship. Studies conducted by (Mwirigi and Ouma, 2017) employed a mixed-methods approach to investigate the influence of entrepreneurship education, networking, and mentoring on the success of women in ICT entrepreneurship in Zambia. They conducted surveys with 120 female entrepreneurs and held in-depth interviews and focus group discussions. Key findings emphasized the significance of support mechanisms, including mentoring and networking, in facilitating women's engagement in the sector.

III. METHODOLOGY

The methodology chosen aligns with the research objectives, enabling a comprehensive exploration of the factors influencing women's involvement in ICT entrepreneurship within the Zambian context.

3.1 Research Design

Research design is the conceptual structure within which research is conducted and includes the collection and analysis of data which are relevant to the research ((Kothari, 2004). McMillan & Schumacher (2001) defines it as a plan showing the approach and strategy of investigation selected to obtain reliable and valid data that achieves the research objectives and answers research questions effectively. This study incorporated both quantitative and qualitative approaches to capture the multifaceted nature of the phenomenon and thus give comprehensive findings of the study.

3.2 Quantitative Approach

The quantitative component of the research involved the systematic collection of numerical data through structured questionnaires. This approach is instrumental in quantifying various aspects related to women's involvement in ICT entrepreneurship, such as access to resources, business performance, and the impact of government policies. In this study, the use of questionnaires allowed for the efficient collection of data from a sizable sample of women entrepreneurs in the ICT sector, enhancing the reliability and validity of the results.

3.3 Mixed-Methods Approach

The integration of quantitative and qualitative data not only enriches the depth of analysis but also enhances the validity of the study's findings through data convergence (Creswell, 2017). By employing this approach, the study aimed to bridge the gap between quantitative statistics and qualitative narratives, offering a comprehensive portrayal of the research topic

3.4 Conceptual Framework

In the context of the current study, the TOE framework is used to show that the participation women in ICT among SMEs is determined by the influence of technological, organizational and environmental factors. Other theories like Unified Theory of Access and Use of Technology (UTAUT), and Diffusion of Innovation Theory (DIT) -focused more on the adoption of technology by individuals rather than by organizations and as such offered a partial explanation for the organizational adoption of technology and for this reason, they were not detailed enough for this particular study.

3.5 Data Collection Methods

Data collection was done through in-depth interviews conducted with key respondents who in this case are the women engaged in running businesses of their own. Semi-structured interviews were conducted with stakeholders of the industry who include mostly female customers that the researcher interacted with in different settings. A questionnaire was electronically distributed among the female traders around the CBD area in Lusaka.

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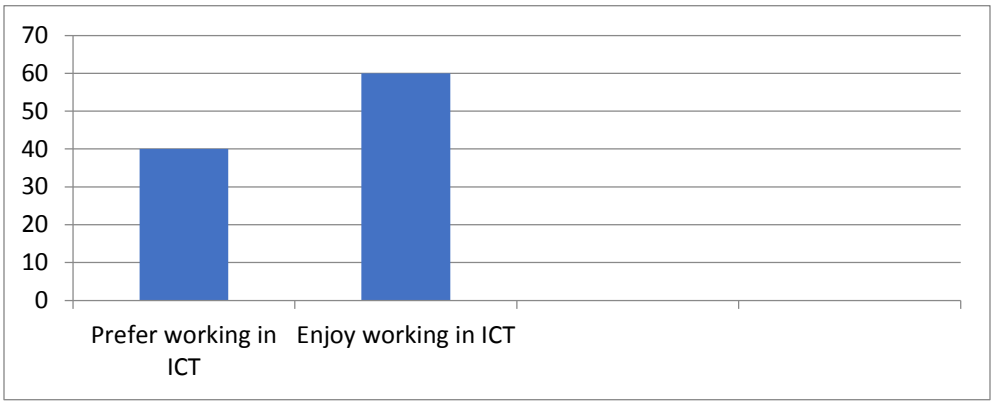
3.6 Data Analysis

The data analysis process in this research was a systematic and rigorous endeavor that involved both quantitative and qualitative data. The quantitative data collected through structured questionnaire were analyzed using SPSS version 27. Qualitative data from in-depth interviews and focus group discussions was subjected to thematic analysis. Thematic analysis is a widely used method for identifying, analyzing, and reporting patterns (themes) within qualitative data (Braun and Clarke, 2006).

IV. RESULTS PRESENTATION

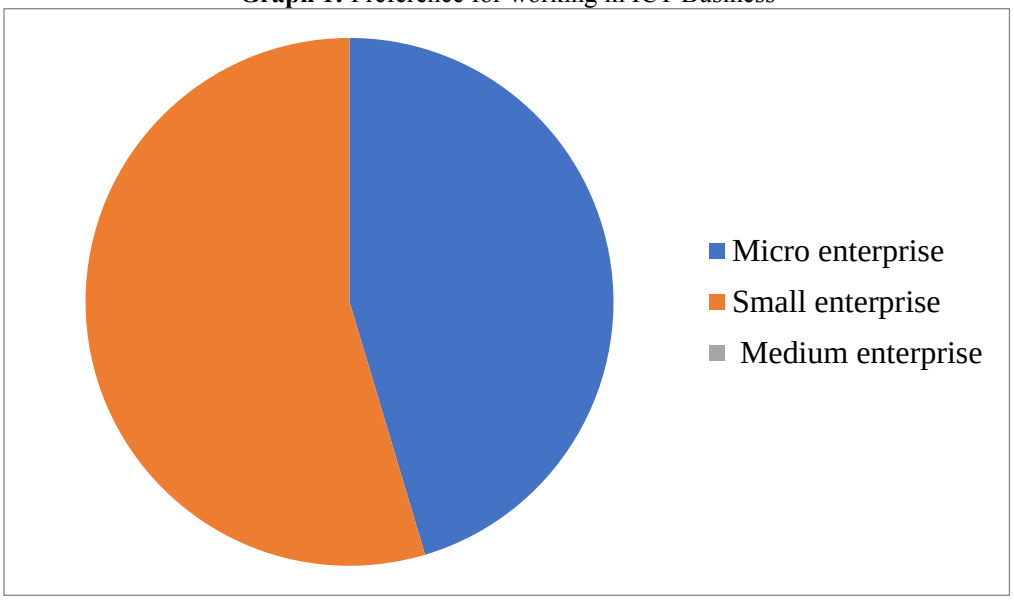
Objective 1: To Establish the Prevalence of Women's Participation in ICT Entrepreneurship in Zambia

Graph 1 illustrates respondents' attitudes towards working in ICT. The graph illustrates that 40% of the respondents prefer to work in ICT while 60% of the respondents actually do enjoy working in ICT.



Pie Chart 1: presents a cross-tabulation of respondents based on their level of enterprise and their direct involvement in technical solutions for ICT

Graph 1: Preference for working in ICT Business



Pie Chart 1: Prevalence of Women Participating in ICT

Among those in Micro Enterprises, the majority (62.3%) affirmed their involvement, while 37.7% indicated otherwise. In the Small Enterprise category, a higher proportion (75%) reported direct involvement, with 25% not being directly involved. No respondents from Medium Enterprises provided data for this category. In total, 68% of respondents

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affirmed their involvement in technical solutions for ICT, while 32% did not. This indicates a significant level of engagement, particularly in Micro and Small Enterprises.

Table 1: Regression Coefficients- Prevalence levels

Coefficients

Model		Unstandardized Coefficients		Standard Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	**(Constant)**	2.029	3.939		.515	.608	-5.801	9.860
	Marital Status	-2.190	1.589	-.232	-1.378	.172	-5.349	.969
	Highest level of Education:	1.501	1.002	.292	1.498	.138	-.490	3.492
	Level of Employment:	-.472	.697	-.077	-.677	.500	-1.858	.914
	Monthly Basic Pay:	-1.464	.435	-.521	-3.366	.001	-2.329	-.599

a. Dependent Variable: How many Women are employed at your workplace or in your department:

The table provides the regression coefficients for the model predicting "How many Women are employed at your workplace or in your department." Each predictor variable's unstandardized and standardized coefficients are displayed. The "Constant" term has an unstandardized coefficient of 2.029 with a standard error of 3.939.

Objective 2: To Identify Factors Affecting Women MSMEs Participation in ICT

Table 2: Regression Coefficients on factors affecting women MSMEs participation in ICT

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
Individual factors	.251	.661	.049	.380	.705	-1.062	1.565
Social Cultural Factors	.342	.799	.061	.428	.670	-1.247	1.931
Economic Factors	.771	.759	.157	1.016	.313	-.738	2.279
Education Factors	-.448	.913	-.078	-.491	.625	-2.264	1.368

The challenges identified include limited access to necessary equipment, a lack of public understanding of the industry, insufficient capital, inadequate infrastructure and regulatory gaps. Gender discrimination and biasness were also noted. One participant highlighted,

"*Access to equipment, lack of understanding of the industry among citizens, lack of capital, lack of infrastructure in the country to support the industry and lack of regulations*."

It was observed that women MSMEs participation in ICT entrepreneurship remains relatively low. However, there is a notable enthusiasm and interest among women to engage in this sector. According to one participant,

It has still remained low but there is huge appetite and interest among women."

Objective 3: To Investigate Strategies that Promote Women MSMEs Participation in ICT

Concerning this particular objective, it was found that some of the strategies that can be used to promote women MSME's to participate in ICT include: Creation of accessibility of educational opportunities to encourage the trend of increasing enrollment of women in ICT and engineering courses, creating unlimited access to quality education and awareness about STEM fields, access to capital and financial resources for women MSMEs in ICT such as CDF, CEEC empowerment fu, targeted initiatives, including micro-financing programs and venture capital opportunities tailored for women-led ventures and implementation of policies that facilitate flexible work arrangements and provide adequate support systems.

In a face-to- face interview with women, one female participant said *'Madam, the strategies that promote women participation among MSMEs in ICT include access to education- STEM programs, Gender Inclusive Policies among women,'*

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Another female participant added *'Mmm you know what madam! Strategies include creating mentors and role models in ICT, also workshops on mentorship access, access to funds from Constituency Development Funds- CDF and CEEC and government partnership to create funding for women'.*

V. DISCUSSION OF RESULTS

The results indicated a generally positive attitude towards working in ICT, particularly in terms of payment. This study is in line with (Deloite, 2014) who indicated positive relationship between income, mobile phone ownership and internet usage. There is a significant level of engagement by women, particularly in micro and small enterprises and not in medium enterprises which is mostly dominated by men. A study by (Global Entrepreneurship Monitor, 2019) states that women owned-ICT businesses are still a minority.

The factors identified included limited access to necessary equipment, empowerment, finances, a lack of public understanding of the industry, and regulatory gaps. Gender discrimination and biasness were also noted. A study by (World Economic Forum, 2020) highlights that women often face these barriers to acquiring essential technical skills limiting the ability to engage in tech driven enterprises.

Based on the study findings the strategies that were found to likely promote women MSME's participation in ICT include: policy interventions, educational reforms, targeted financial support, and cultural shifts towards inclusivity; laying the foundation for informed recommendations and policy interventions other major strategies included, Establishing Gender-Inclusive Policies, Strengthening Educational Opportunities, Investing in STEM education and vocational training for women to bridge the skills gap and promote greater participation in ICT entrepreneurship

VI. CONCLUSION AND RECOMMENDATIONS

The purpose of this study was to evaluate the participation of women in ICTs among MSMEs in Zambia, particular in the CBD of Lusaka. The study employed the TOE theoretical framework in order to formulate the variables of analysis. This is because the TOE framework allows the researcher to consider the organizational and environmental, as well as macro-environmental characteristics of the topic of study. The study used a mixed- methods approach that allows the researcher to use both qualitative and quantitative methods of research. Based on the findings, it is evident that there is a significant gender gap as far as evaluating women participation in ICT among MSMEs is concerned.

Based on the study findings, the study recommended the following as a way of promoting women MSMEs participation in ICT;

- Promoting STEM Education.
- Partnering with Financial Institutions in women in ICT empowerment programs.
- Advocate for Gender-Inclusive Policies as far as ICT is concerned.
- Launch Awareness Campaigns.
- Regular Reporting and Market Analysis of the participation of women MSME's in ICT.

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