INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) AND WOMEN'S SOCIO-ECONOMIC EMPOWERMENT: A CASE STUDY OF AHOADA EAST AND AHOADA WEST LOCAL GOVERNMENT AREAS OF RIVERS STATE., NIGERIA.

A RESEARCH PROJECT

BY

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR OF SCIENCE (B.SC) DEGREE IN COMPUTER SCIENCE

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DECLARATION

I, Easter Madonna, with registration number PSC1813798, hereby declare that this research project entitled Information and Communication Technology (ICT) and Women's Socio-Economic Empowerment: A case study of Ahoada East and Ahoada West Local Government Areas of Rivers State.' was written by me and that it is the record of my own research work. It has not been presented in any previous application for any degree. All degree. All sources of information are specifically acknowledged using references.

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CERTIFICATION

This research project entitled Information and Communication Technology (ICT) and Women's Socio-Economic Empowerment: A case study of Ahoada East and Ahoada West Local Government Areas of Rivers State.' meets the regulations governing the award of the degree of Bachelor of Science (B.Sc) in Computer Science of the University of Benin and is approved for its contribution to knowledge and literacy presentation.

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DEDICATION

This research work is dedicated to the Almighty God.

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ABSTRACT

This study examined the impact of Information and Communication Technology (ICT) on the socio-economic empowerment of women in Ahoada East and Ahoada West Local Government Areas of Rivers State, Nigeria. ICT has been widely recognized as a tool for development; however, women in rural communities often experience limited access and use due to infrastructural, economic, and socio-cultural challenges. The study adopted a descriptive survey research design. A sample of 384 women was selected using Cochran's sample size formula. Data were collected using a structured questionnaire titled ICT and Women's Socio-Economic Empowerment Questionnaire (ICTWSE-Q). Descriptive statistics (frequency, percentage, mean, and standard deviation) and inferential statistics (simple linear regression) were employed for data analysis at a 0.05 level of significance. Findings revealed that women in the study area have moderate access to ICT tools, particularly mobile phones, and make regular use of ICT for communication and economic activities. ICT access, training, and use were found to significantly enhance women's income generation, decision-making power, access to education and health information, and participation in entrepreneurial activities. However, major barriers such as poor electricity supply, high cost of data and devices, limited digital skills, and socio-cultural restrictions significantly hinder effective ICT adoption. All null hypotheses tested were rejected, indicating that ICT has a significant positive influence on women's socio-economic empowerment. The study concludes that ICT is a powerful tool for empowering women in rural communities, but its full potential can only be realized through improved infrastructure, affordable ICT services, targeted digital literacy programs, and gender-sensitive policies aimed at promoting inclusive and sustainable development.

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CHAPTER ONE

INTRODUCTION

1.5 Background of the study

Countries all across the world have acknowledged ICT as a powerful instrument for boosting economic activity, facilitating effective government, and growing human resources. A greater number of people are becoming aware of the more advanced and varied opportunities that contemporary technology offers society. Unprecedented changes in how people engage socially, do business and communicate have been brought about by IT and communication technology. Numerous ways in which people's lives are improved and made more pleasant through the development of new types of technology and creative uses of both new and ancient technologies. The ability of ICTs to access, share, and apply knowledge and information to almost every element of human involvement is leading to an increased understanding of their potential to power the emerging, worldwide knowledge-based economy (Noor Sharifah, S. S. (2006).

ICT has brought about unprecedented changes in the way people communicate; conduct business, pleasure and social interaction.

The evolution of new forms of technologies and imaginative forms of applications of the new and older technologies makes the lives of the people better and more comfortable in several ways. As an information and knowledge-based tool, ICTs can enhance networking, participation, and advocacy within society. They also have the potential to improve interaction between governments and their citizens, fostering transparency and accountability in governance as a result. ICTs are becoming a vital engine of growth for the world economy. They have the potential to enable many enterprising individuals, firms, communities, in all parts of the planet, to address economic and social challenges with greater efficiency and imagination. ICTs and the Internet offer vast, new and unprecedented opportunities for human development

and empowerment.

ICTs have the potential to significantly advance gender equality and the political, economic, as well as social empowerment of women. In underdeveloped nations, among the obstacles preventing access to the ICT infrastructure are poverty, illiteracy, a lack of computer literacy as well as language hurdles. These issues are particularly severe for women. However, barriers that go beyond concerns with technical infrastructure and the socioeconomic setting restrict women's access to ICTs.

Women's roles and relationships, which are socially and culturally formed, continue to have a cross-cutting function in determining how well men and women may engage on an equal footing. As per World Bank (2008), one of the essential components of reducing poverty and promoting sustainable development is empowerment. Therefore, it is crucial to provide women the capacity to transform their life by allowing their contribution to society, which will eradicate or significantly reduce poverty.

Information and Communication Technology (ICT) has become a pivotal tool in driving socio-economic progress across the globe, particularly in developing nations. In rural areas of Nigeria, where traditional gender roles and socio-cultural factors often limit women's access to resources and opportunities, ICT has emerged as a potential game-changer. ICT offers new pathways for enhancing women's socio-economic empowerment by providing access to education, health services, financial resources, and markets. Despite the potential, the extent to which ICT is leveraged to empower women in rural and marginalized areas, such as the Ahoada East and Ahoada West Local Government Areas (LGAs) of Rivers State, remains under explored.

Women in these communities face significant challenges in achieving socio-economic independence. These challenges include

limited access to formal education, inadequate healthcare facilities, and restricted economic participation. In such contexts, ICT has the potential to offer solutions, enabling women to enhance their livelihoods, access information, and engage in entrepreneurial activities. However, the impact of ICT on women's empowerment in these regions has not been systematically studied, particularly in relation to socio-economic outcomes such as income generation, access to markets, and financial inclusion.

This study aims to examine the impact of ICT on women's socio-economic empowerment in Ahoada East and Ahoada West LGAs, exploring how digital tools and platforms influence women's participation in economic activities, decision-making processes, and overall well-being. By focusing on these rural communities, the research seeks to provide a comprehensive understanding of the role of ICT in overcoming gender-based socio-economic barriers and enhancing opportunities for women in the context of development. In doing so, this study aims to contribute to the ongoing discourse on ICT and gender empowerment, providing insights for policy formulation and program implementation aimed at leveraging technology for sustainable rural development and gender equality in Nigeria, (Eileen, 2022).

1.6 Statement of the Problem

While there is existing research on ICT and women's empowerment in general, there may be limited studies that specifically focus on the ICT on women's socio-economic empowerment in rural or less-studied regions of Nigeria, such as the Ahoada East and Ahoada West Local Government Areas (LGAs) in Rivers State. Many studies on ICT and women's empowerment tend to overlook the unique challenges faced by women in remote or underserved areas. These challenges include limited access to technology, lack of infrastructure, cultural barriers, and low digital literacy, which may hinder the effective use of ICT for empowerment. Previous research may not fully capture how ICT affects women's socio-economic status (e.g., income, employment, education, and social participation) in a specific region.

There might be a lack of data that addresses how ICT tools contribute to changes in women's economic activities, decision-making power, or social mobility in these particular LGAs.

1.7 Aim of the Study

The aim of this study is to examine the impact of Information and Communication Technology (ICT) on the socio-economic empowerment of women in Ahoada East and Ahoada West Local

Government Areas of Rivers State. The study seeks to determine how ICT tools and digital literacy contribute to improving women's income, decision-making power, education, and participation in community development.

1.8 Objectives of the Study

1. To determine the extent to which access to ICT tools (such as mobile phones, internet, and digital platforms) influences socio-economic empowerment of women in Ahoada East and Ahoada West LGAs
2. To assess how ICT training and digital literacy programs enhance women's economic opportunities, self-reliance and participation in decision-making and community activities in Ahoada East and Ahoada West LGAs
3. To identify barriers hindering women's adoption of ICT for socioeconomic empowerment, and explore possible strategies for overcoming these challenges in Ahoada East and Ahoada West LGAs
4. To evaluate the contribution of ICT, use to women's participation in entrepreneurship, education, and community development in Ahoada East and Ahoada West LGAs

1.5 Research Questions

1 To what extent does access to ICT tools (such as mobile phones, internet, and digital platforms) influence the socioeconomic empowerment of women in Ahoada East and Ahoada West LGAs?
2 To what extent does ICT training and digital literacy play in enhancing women's economic opportunities and decision-making power in Ahoada East and Ahoada West LGAs?
3 What are the major barriers women face in adopting ICT for socioeconomic empowerment, and how can these challenges be mitigated in Ahoada East and Ahoada West LGAs?
4 In what ways has the use of ICT contributed to women's participation in entrepreneurship, education, and community development in Ahoada East and Ahoada West LGAs?

1.7 Null Hypotheses

The following null hypotheses were formulated to guide the study and tested at .05 alpha level.

1 Access to ICT tools does not significantly influence the socioeconomic empowerment of women in Ahoada East and Ahoada West LGAs?
2 ICT training and digital literacy does not significantly play any role in enhancing women's economic opportunities and decision-making power in Ahoada East and Ahoada West LGAs?

3 There are no barriers in adopting ICT for socioeconomic empowerment in Ahoada East and Ahoada West LGAs?

4 The use of ICT does not contribute significantly to women's participation in entrepreneurship, education, and community development in Ahoada East and Ahoada West LGAs?

1.7 Significance of the Study

This study is significant because it highlights the transformative role of Information Communication Technology (ICT) in advancing the socioeconomic empowerment of women in Ahoada East and Ahoada West LGAs.

The findings will provide insights into how ICT tools can enhance women's income generation, decision-making power, access to education, and participation in community development. This empowers them to overcome traditional barriers of inequality and marginalization.

The study will serve as evidence to guide the formulation of gender-sensitive ICT policies and rural development programs that promote inclusivity, digital literacy, and infrastructure investment in underserved areas.

The research will help NGOs and international organizations design more targeted interventions that use ICT as a tool for women's empowerment, poverty reduction, and sustainable development.

The study contributes to the existing body of knowledge on ICT for development by providing empirical evidence on its impact on women's socioeconomic empowerment in rural settings, especially within the Nigerian context.

Empowering rural women through ICT not only benefits individuals but also strengthens families, communities, and the national economy by reducing gender inequality and promoting inclusive growth.

1.8 Scope of the Study

The study was delimited to information and communication technology (ICT) and women's socio-economic empowerment: A case study of Ahoada East and Ahoada West Local Government Areas of Rivers State. The study was also delimited to four purposes of the study, four research questions and four hypotheses.

The target population consisted of women in of different age groups, marital status, educational backgrounds, and occupational categories in Ahoada East and Ahoada West LGAs of Rivers State.

It was also delimited on four key dimensions of empowerment: Economic (income generation, entrepreneurship, and financial independence), Social (participation in household decision-making and community activities) and Educational (access to literacy, digital training, and online learning).

CHAPTER TWO

LITERATURE REVIEW

2.1 ICT and Women's Socioeconomic Empowerment

Information and Communication Technology (ICT) has become one of the most influential drivers of social and economic transformation globally. The rapid advancement of mobile phones, internet connectivity, and digital platforms has opened new opportunities for inclusion and participation, particularly for marginalized groups. Women in rural areas, who are often excluded from mainstream economic and political systems, increasingly rely on ICT to access knowledge, markets, healthcare, education, and governance structures (World Bank, 2020).

Women's empowerment is multidimensional, extending beyond financial independence to include self-confidence, access to resources, voice in decision-making, and agency in shaping their futures. Stromquist (2015) identifies empowerment as cognitive, psychological, economic, and political. ICT contributes to these dimensions by creating avenues for rural women to learn, earn, and participate in society.

2.1.1 ICT as a Tool for Economic Empowerment

Economic empowerment remains one of the most visible outcomes of ICT adoption among rural women. Access to mobile phones, mobile money platforms, and online marketplaces enables women to engage in business without being confined to their immediate geographic location. In Nigeria, rural women traders use WhatsApp and Facebook to advertise products such as agricultural produce, textiles, and crafts (Oyewole & Popoola, 2018).

Akinola and Akintunde (2018) found that mobile money services improved rural women's savings culture and reduced dependence on cash-based transactions. These technologies provided flexibility, reduced travel costs, and gave women greater control over their finances. Furthermore, ICT has introduced new income streams, such as online freelancing, mobile retailing, and digital services that were previously unavailable to rural women.

2.1.2 ICT and Educational Empowerment

Education is central to women's empowerment, and ICT has widened access to learning resources. In rural Nigeria, where school attendance among women remains lower than men due to cultural and economic barriers, ICT has provided alternative platforms for literacy and vocational training. Radio programs broadcast in local languages are used to teach basic literacy and

numeracy, while mobile learning apps provide women with flexible learning opportunities (Yakubu & Bello, 2020).

NGOs such as the Women's Technology Empowerment Centre (W.TEC) have pioneered digital literacy programs targeting women and girls in underserved communities. These initiatives equip women with basic computer literacy, coding, and digital entrepreneurship skills, enabling them to participate more fully in the digital economy (Adesina & Akinwale, 2021).

2.1.3 ICT and Social Empowerment

Social empowerment refers to the ability of individuals to participate in social networks, express themselves freely, and influence their communities. ICT facilitates this by providing women with access to communication platforms such as WhatsApp groups, Facebook, and online forums where they can share experiences and mobilize support.

In Northern Nigeria, women's groups use WhatsApp to discuss maternal health, market prices, and community issues, creating spaces for dialogue previously dominated by men (Ojo & Olayinka, 2020). ICT also enables women to challenge harmful cultural practices. For example, campaigns against early marriage and gender-based violence have gained momentum through online

advocacy led by women's groups in rural Nigeria (Adeleke & Yusuf, 2021).

2.1.4 ICT and Political Empowerment

Political empowerment entails increased participation in leadership and decision-making at household, community, and national levels. ICT provides platforms for rural women to access political information, monitor governance processes, and engage in advocacy.

Studies in Nigeria show that women who access political information online are more likely to participate in local meetings, vote, and demand accountability from leaders (Eze & Nwankwo, 2020). Social media platforms, though often dominated by urban users, are increasingly being adopted in rural communities for political discussions. For instance, during local elections in Kwara State, rural women used WhatsApp to share voter education materials and mobilize turnout (Okeke & Nwachukwu, 2019).

2.1.5 ICT and Health Empowerment

Another dimension of empowerment where ICT has made significant impact is healthcare. Rural women often face barriers in accessing health services due to distance, cost, and lack of qualified personnel. ICT addresses these challenges through mobile health (mHealth) initiatives that deliver maternal health tips, reminders for

child immunization, and health education via SMS and apps. In Nigeria, the Mobile Midwife Program provides rural women with prenatal and postnatal care information through SMS in local languages, improving maternal and child health outcomes (Yakubu & Bello, 2020).

2.2 ICT Access and Socioeconomic Outcomes

The extent to which rural women can benefit from ICT depends significantly on their level of access. Access encompasses availability, affordability, usability, and relevance. ICT access is not limited to smartphones or computers; it includes radios, televisions, landlines, and community ICT centers, all of which serve as gateways to information. For rural women, who often face systemic barriers to resources, ICT access is transformative because it bridges information gaps, reduces geographic isolation, and connects them to economic, social, and political opportunities (World Bank, 2020). Scholars argue that ICT access must be assessed not only in terms of physical devices but also in terms of meaningful connectivity-reliable electricity, affordable data, digital literacy, and socio-cultural acceptance (Adeleke & Yusuf, 2021). This section examines how ICT access shapes outcomes in key domains: business and entrepreneurship, agriculture, education, health, political participation, and social interaction.

2.2.1 ICT Access and Business/Entrepreneurship

Access to ICT has revolutionized business operations among rural women. Mobile phones and internet access allow women to advertise, negotiate, and transact with customers and suppliers beyond their immediate communities. In Nigeria, women entrepreneurs in rural Oyo and Enugu States use WhatsApp and Facebook to sell farm produce, tailoring services, and small household items (Okeke & Nwachukwu, 2019). These platforms reduce dependence on middlemen, increase profit margins, and expand customer bases.

Oyewole and Popoola (2018) found that rural women who accessed mobile money platforms improved their ability to manage small enterprises, save profits, and reinvest in their businesses. This financial inclusion has ripple effects, as women reinvest income in children's education, family nutrition, and community projects.

2.2.2 ICT Access and Agriculture

Agriculture remains the backbone of rural economies, and rural women are key participants in Nigeria's agricultural sector. ICT access enhances women's agricultural productivity by providing market information, weather updates, and modern farming techniques.

Yakubu and Bello (2020) observed that rural women farmers in Kaduna State used mobile phones to access daily weather forecasts, helping them plan planting and harvesting seasons. Similarly, agricultural extension services are now delivered through SMS, reducing the need for physical visits from extension workers. ICT applications also connect women farmers to buyers, ensuring fairer prices for produce.

2.2.3 ICT Access and Education

ICT plays a crucial role in expanding educational access for rural women. In Nigeria, radio and television programs broadcast in local languages provide literacy training, agricultural education, and civic education (Eze & Nwankwo, 2020). Mobile learning applications have also created opportunities for adult women to acquire basic literacy and numeracy skills. Adesina and Akinwale (2021) report that ICT-enabled literacy classes in rural Ekiti State improved women's confidence in managing small businesses and participating in community leadership. These programs also addressed generational gaps, as young women often trained older women on how to use smartphones and social media.

2.2.4 ICT Access and Health Outcomes

Access to ICT has also improved rural women's health and that of their families. Mobile health (mHealth) initiatives deliver maternal

health information, vaccination reminders, and nutrition tips via SMS in local languages. In Nigeria, the Mobile Midwife program provided pregnant women with weekly voice messages about prenatal care and nutrition, significantly reducing maternal and infant mortality rates in participating communities (Yakubu & Bello, 2020). Similarly, rural women in Enugu State reported using WhatsApp groups to share information about local clinics and drug availability (Adeleke & Yusuf, 2021).

2.2.5 ICT Access and Political Participation

ICT enhances women's access to political processes by providing platforms for information and mobilization. In Nigeria, rural women use social media and SMS campaigns to share voter education materials, mobilize community meetings, and advocate for policy changes (Ojo & Olayinka, 2020). Women in rural areas who gain access to ICT are more likely to participate in elections, attend political rallies, and demand accountability from leaders.

During the 2019 general elections, women in rural Kwara State used WhatsApp groups to coordinate voter education activities, increasing women's turnout in local polling units (Okeke & Nwachukwu, 2019). These platforms provided anonymity and safety, allowing women to express political opinions without fear of retribution.

2.2.6 ICT Access and Social Networks

Access to ICT enhances women's ability to form social networks and support groups. In rural Nigeria, women have established WhatsApp and Facebook groups for cooperative societies, savings groups, and agricultural collectives (Adesina & Akinwale, 2021). These digital networks provide emotional support, financial assistance, and platforms for collective advocacy. In Northern Nigeria, rural women use online groups to discuss cultural practices, health issues, and entrepreneurship, creating a sense of solidarity and community (Ojo & Olayinka, 2020). ICT thus strengthens social capital, which is essential for empowerment.

2.2.7 Challenges to Access

Despite the potential of ICT access, rural women face barriers that limit outcomes. These include lack of electricity, poor internet infrastructure, high costs of devices and data, and restrictive gender norms (Eze & Nwankwo, 2020). Many rural women rely on shared devices, limiting privacy and control over ICT use. Without meaningful connectivity, access remains superficial and does not translate into empowerment.

2.3 ICT Training and Digital Literacy for Women

While access to ICT is the first step toward empowerment, the ability to use ICT tools effectively is equally crucial. Digital literacy is more

than just knowing how to operate a mobile phone or computer; it includes the capacity to search, evaluate, and apply digital information to solve problems. For rural women, ICT training and digital literacy provide pathways to economic independence, educational advancement, social engagement, and political participation (Adesina & Akinwale, 2021).

Digital literacy programs play a transformative role in bridging the gender digital divide. Women who are digitally literate are more likely to adopt ICT for agricultural practices, health monitoring, entrepreneurship, and civic engagement (Yakubu & Bello, 2020). Without these skills, access to ICT may remain underutilized, leading to limited empowerment outcomes.

2.3.1 The Role of ICT Training in Women's Empowerment

ICT training equips rural women with practical skills for daily life and economic activities. Training programs often include modules on basic computer literacy, mobile phone use, internet navigation, social media engagement, and mobile money applications. In Nigeria, several organizations and government agencies have launched ICT training programs for women. The National Information Technology Development Agency (NITDA) has organized rural digital literacy workshops that target women in underserved communities (Adeleke & Yusuf, 2021). Similarly, the

Digital Girls Club Initiative introduced by the Federal Ministry of Communication and Digital Economy aims to inspire girls and young women to pursue ICT careers. Empirical evidence shows that training programs improve self-confidence and reduce women's dependency on male relatives for digital tasks. In rural Enugu State, women who participated in ICT training sessions reported better ability to market goods online and access health information independently (Okeke & Nwachukwu, 2019).

2.3.2 ICT Training and Economic Empowerment

One of the most immediate benefits of ICT training is economic empowerment. Women who are digitally literate can leverage ICT tools to expand micro-enterprises, manage finances, and access e-commerce platforms. For instance, rural women in Ogun State who participated in mobile banking training programs significantly increased their savings habits and reduced vulnerability to financial exploitation (Oyewole & Popoola, 2018). Training in the use of point-of-sale (POS) terminals also enabled women to participate in financial services, creating a new line of income.

2.3.3 ICT Training and Agricultural Productivity

Agriculture remains central to rural women's livelihoods, and ICT training enhances their productivity by providing skills to use mobile applications, SMS platforms, and online agricultural resources. In

Nigeria, agricultural extension services increasingly integrate ICT literacy training. Women farmers in Kaduna State were trained to use mobile phones for weather forecasts, pest management, and market prices, resulting in higher yields (Yakubu & Bello, 2020). Similarly, in Delta State, rural women who received training in accessing agricultural videos and tutorials improved adoption of modern farming techniques (Eze & Nwankwo, 2020).

2.3.4 ICT Training and Health Literacy

ICT training also improves rural women's health outcomes. Women who are digitally literate can access online health information, use mobile health applications, and communicate with healthcare providers. In Nigeria, mHealth programs have coupled ICT training with maternal health awareness campaigns. For example, women in Ekiti State who underwent training on mobile phone applications reported increased ability to track pregnancy milestones and child immunization schedules (Adesina & Akinwale, 2021).

2.3.5 ICT Training and Education

Education and ICT training are deeply interconnected. Women with basic literacy are more likely to succeed in ICT training programs, and ICT training in turn enhances their educational opportunities. In Nigeria, adult education programs increasingly incorporate ICT modules, ensuring that women not only learn to read and write but

also acquire digital literacy. Radio and television literacy campaigns often include practical demonstrations of mobile phone use, while community ICT centers provide hands-on training (Okeke & Nwachukwu, 2019).

2.3.6 ICT Training and Political Participation

Training in ICT use also influences women's political participation. Digital literacy allows rural women to access voter education materials, engage in online political discussions, and advocate for community interests. In Nigeria, women trained in the use of social media platforms such as Facebook and WhatsApp have organized political discussions and mobilized for elections in rural communities (Ojo & Olayinka, 2020). ICT training also enables women to engage with government portals, track public budgets, and demand accountability.

2.3.7 Challenges of ICT Training and Digital Literacy

Despite the successes of ICT training, rural women face challenges that limit their participation.

1. **Cultural Barriers:** In many Nigerian communities, patriarchal norms discourage women from engaging in ICT training (Adeleke & Yusuf, 2021).
2. **Economic Barriers:** Training programs often require access to devices and data, which are costly.

3. **Infrastructure Barriers:** Poor electricity supply and limited internet coverage restrict practical training.
4. **Educational Barriers:** Low literacy levels hinder women's ability to fully benefit from ICT training.

2.4 Barriers to ICT Adoption among Rural Women

Despite the documented benefits of ICT in promoting women's socioeconomic empowerment, adoption rates among rural women remain disproportionately low in Nigeria and across developing countries. The digital gender divide persists because access does not always translate into meaningful use. Barriers include infrastructural deficits, economic limitations, cultural restrictions, educational gaps, and weak policy frameworks. Scholars emphasize that unless these obstacles are addressed, rural women will remain marginalized in the digital economy (Adeleke & Yusuf, 2021; Hafkin, 2019).

2.4.1 Infrastructural Barriers

Infrastructure forms the backbone of ICT access. Rural areas in Nigeria often face poor electricity supply, limited broadband penetration, and inadequate telecommunications infrastructure.

1. **Electricity:** According to the Nigerian Electricity Regulatory Commission (NERC, 2022), nearly 55% of rural communities are not connected to the national grid, and where they are, power is

erratic. Without stable electricity, ICT devices cannot be used consistently (Yakubu & Bello, 2020). Women often depend on community charging points, which are costly and inconvenient.

2. **Internet Access:** The Nigerian Communications Commission (NCC, 2021) reported that broadband penetration is higher in urban than rural areas. While cities like Lagos and Abuja enjoy 4G coverage, many rural areas are limited to 2G or no coverage at all. This restricts women from accessing real-time information or using advanced applications (Eze & Nwankwo, 2020).
3. **Telecommunications Infrastructure:** Telecommunication providers often view rural communities as commercially unattractive due to low population density and low purchasing power (Okeke & Nwachukwu, 2019). As a result, rural women remain isolated from ICT-driven opportunities.

2.4.2 Economic Barriers

Affordability is another critical barrier. ICT devices, data costs, and maintenance expenses remain beyond the reach of many rural women.

1. **Device Costs:** Smartphones, laptops, and tablets are costly for women in rural Nigeria, where average incomes are low (Adeleke & Yusuf, 2021). Many women rely on shared devices, reducing privacy and autonomy.

2. **Data Costs:** Internet bundles are expensive relative to income levels. Women often prioritize basic needs like food and healthcare over ICT expenses (Oyewole & Popoola, 2018).
3. **Opportunity Costs:** Participation in ICT training or use requires time away from income-generating activities and household responsibilities. Given women's heavy domestic workload, these opportunity costs are significant (Adesina & Akinwale, 2021).

2.4.3 Educational and Digital Literacy Barriers

Low literacy levels among rural women limit their ability to adopt ICT effectively.

1. **Basic Literacy:** UNESCO (2021) estimated that nearly 50% of rural Nigerian women lack basic literacy skills. Without reading and writing proficiency, women struggle to navigate mobile applications, search engines, and online platforms (Eze & Nwankwo, 2020).
2. **Digital Skills Gap:** Even literate women often lack digital skills. A study in Enugu State revealed that women who had mobile phones primarily used them for calls and SMS but not for accessing online markets or e-learning platforms due to lack of digital literacy (Okeke & Nwachukwu, 2019).
3. **Generational Divide:** Older women face more difficulty adopting ICT compared to younger women, who are often more tech-savvy.

This generational divide creates dependency, where older women rely on children or male relatives to use digital devices.

2.4.4 Socio-Cultural Barriers

Cultural norms and gender dynamics play a significant role in restricting women's ICT adoption.

1. **Patriarchy:** In many Nigerian communities, men control household decision-making, including whether women can own or use ICT devices (Ojo & Olayinka, 2020). Women's digital participation is often seen as a threat to traditional authority.
2. **Restrictions on Mobility:** Women in Northern Nigeria often face restrictions on movement, which prevents them from attending ICT training sessions or accessing community ICT centers (Yakubu & Bello, 2020).
3. **Perceptions of ICT Use:** Some communities associate women's use of ICT with promiscuity or disobedience, discouraging them from exploring digital platforms (Adesina & Akinwale, 2021).

2.4.5 Policy and Institutional Barriers

Weak policy frameworks and inadequate institutional support hinder ICT adoption among rural women.

1. **Policy Gaps:** Nigeria's National ICT Policy emphasizes digital inclusion but does not provide sufficient mechanisms for targeting

rural women specifically (NITDA, 2020). Programs are often urban-centered, leaving rural women underserved.

2. **Implementation Challenges:** Even when policies exist, poor implementation undermines their impact. For instance, community ICT centers established in some Nigerian states remain non-functional due to lack of funding and maintenance (Eze & Nwankwo, 2020).
3. **Limited Collaboration:** Lack of coordination between government agencies, NGOs, and private sector actors results in duplication of efforts and reduced effectiveness of ICT projects targeting women (Adeleke & Yusuf, 2021).

2.4.6 Psychological Barriers

Beyond external obstacles, women's attitudes and self-perceptions influence ICT adoption.

1. **Fear of Technology:** Some rural women perceive ICT devices as complicated or intimidating, leading to technophobia (Okeke & Nwachukwu, 2019).
2. **Low Self-Confidence:** Limited prior exposure to ICT reduces confidence in using digital platforms (Adesina & Akinwale, 2021).
3. **Risk Perceptions:** Concerns about online fraud, harassment, or exposure to harmful content discourage women from engaging with ICT (Ojo & Olayinka, 2020).

2.5 Empirical Studies in Nigeria

Empirical studies provide evidence-based insights into how ICT influences the socioeconomic empowerment of rural women in Nigeria. Unlike conceptual discussions, these studies examine lived experiences and measurable outcomes, revealing both progress and persistent challenges. Nigeria's vast diversity—in culture, religion, economy, and geography—means ICT adoption and its impacts vary across different regions. This section reviews empirical evidence from the North, South, East, and West of Nigeria, highlighting successes, barriers, and opportunities.

2.5.1 ICT and Women Empowerment in Northern Nigeria

Northern Nigeria presents unique challenges due to religious conservatism, gender norms, and lower educational attainment among women. Despite these barriers, empirical studies show ICT's growing role in empowering rural women. Yakubu and Bello (2020) investigated rural women in Kaduna State and found that mobile phones improved access to agricultural extension services, market information, and weather updates. However, women's use of ICT was limited by male household control over device ownership. In Kano State, Aliyu and Musa (2019) reported that women who participated in ICT literacy programs through NGOs were able to access maternal health information, improving maternal and child

health outcomes. A survey in Sokoto revealed that radio and mobile phones were the most widely used ICTs, primarily for religious education and health campaigns (Olawale, 2021). Despite positive outcomes, cultural restrictions remain significant. In some communities, women's phone use is monitored by male relatives, limiting privacy and freedom. This demonstrates the complex interplay of empowerment and control in ICT adoption.

2.5.2 ICT and Women Empowerment in Southern Nigeria

Southern Nigeria, particularly the Niger Delta and Yoruba-speaking regions, has higher ICT penetration due to better infrastructure and higher literacy levels. Studies in this region demonstrate more diverse uses of ICT. Oyewole and Popoola (2018) studied rural women in Ogun State and reported that mobile money and POS services increased women's financial independence, enabling them to manage savings and loans. In Delta State, Eze and Nwankwo (2020) found that women farmers used ICT platforms such as SMS and radio broadcasts for agricultural updates, leading to improved productivity. However, poor electricity supply remained a barrier. A study in Ondo State showed that women engaged in cooperative societies used WhatsApp groups to coordinate contributions and loans, strengthening social capital (Adesina & Akinwale, 2021). Southern Nigeria demonstrates the strong potential of ICT to

enhance women's entrepreneurship, financial inclusion, and agricultural productivity when infrastructure is relatively more supportive.

2.5.3 ICT and Women Empowerment in Eastern Nigeria

The eastern region of Nigeria is notable for its entrepreneurial culture, and ICT adoption reflects this trait. Okeke and Nwachukwu (2019) studied women traders in Enugu State and found that social media platforms like Facebook and WhatsApp were widely used for marketing goods. This reduced dependence on local markets and middlemen, expanding their customer base. In Anambra State, women in rural communities reported using mobile phones to access microcredit information, which facilitated investment in small-scale businesses (Ifeanyi & Okafor, 2020). A study in Imo State revealed that ICT literacy programs organized by NGOs increased women's confidence in using digital platforms for e-commerce (Chukwu, 2021). Eastern Nigeria shows how ICT amplifies women's entrepreneurial activities, though challenges such as high data costs and inadequate training persist.

2.5.4 ICT and Women Empowerment in Western Nigeria

Western Nigeria, particularly Lagos and surrounding states, is a hub of ICT activity. Even rural areas benefit from proximity to urban centers. Adesina and Akinwale (2021) studied rural women in Ekiti

State and found that ICT training integrated into adult literacy programs improved women's ability to use smartphones for business promotion and health information. In Osun State, women's groups reported using ICT platforms for political mobilization during local elections, increasing female voter turnout (Ojo & Olayinka, 2020). Research in Lagos rural suburbs found that women used ICT to connect with cooperative societies, enabling them to pool resources for agricultural investments (Adeleke & Yusuf, 2021). Western Nigeria highlights ICT's role in promoting not just economic empowerment but also civic engagement.

2.5.5 Cross-Regional Comparisons

Comparisons across regions reveal variations in ICT adoption and empowerment outcomes:

1. **Northern Nigeria:** Limited adoption due to socio-cultural restrictions, but mobile phones and radio have measurable impacts on health and agriculture.
2. **Southern Nigeria:** Greater adoption driven by stronger infrastructure, with impacts on agriculture, financial inclusion, and cooperatives.
3. **Eastern Nigeria:** ICT enhances women's entrepreneurship through social media and e-commerce platforms.

4. **Western Nigeria:** Adoption is highest due to urban proximity, with impacts spanning business, education, and politics.

These differences demonstrate that while ICT empowers women across Nigeria, the extent and nature of empowerment are context-dependent.

2.5.6 Thematic Patterns in Nigerian Empirical Studies

Several themes emerge from Nigerian empirical studies:

1. **Economic Empowerment:** Women use ICT primarily for business transactions, market access, and microfinance (Oyewole & Popoola, 2018).
2. **Health Empowerment:** Mobile health initiatives have improved maternal and child health awareness (Aliyu & Musa, 2019).
3. **Educational Empowerment:** ICT training integrated with literacy programs enhances both digital and traditional literacy (Adesina & Akinwale, 2021).
4. **Social Capital:** ICT facilitates women's groups, cooperatives, and support networks, particularly through WhatsApp and Facebook (Okeke & Nwachukwu, 2019).
5. **Barriers:** Persistent challenges include poor infrastructure, high costs, low literacy, and socio-cultural constraints (Eze & Nwankwo, 2020).

2.6 Research Gaps

Despite extensive research on ICT and women's empowerment in Nigeria, significant contextual and methodological gaps remain unaddressed.

Most existing studies focus on urban or semi-urban areas, leaving rural communities like Ahoada East and Ahoada West underrepresented. The unique socio-cultural and infrastructural challenges affecting women's digital inclusion in these areas are not adequately documented.

Additionally, prior studies have often emphasized ICT access without analyzing its actual impact on women's socio-economic outcomes such as income generation, decision-making power, or community participation.

Therefore, this study intends to fill these gaps by:

1. Providing empirical evidence on how ICT access and training affect women's economic and social empowerment in rural Rivers State;
2. Highlighting context-specific barriers and opportunities unique to Ahoada East and West LGAs of Rivers State.
3. Offering policy-relevant recommendations to enhance digital inclusion and gender equality in rural communities.

2.7 Summary of Literature Review

The literature reviewed demonstrates the growing significance of Information and Communication Technology (ICT) in shaping the socioeconomic empowerment of women in rural Nigerian communities. While ICT has been widely recognized as a driver of economic growth, social development, and political participation, its role in women's empowerment remains uneven due to structural, cultural, and infrastructural barriers. This section summarizes the key insights drawn from the review, highlighting both opportunities and constraints.

1 ICT as a Catalyst for Economic Empowerment

Studies consistently show that ICT enhances women's income-generating activities. Mobile phones, mobile banking, and social media platforms provide rural women with tools for marketing, financial inclusion, and small-scale entrepreneurship (Oyewole & Popoola, 2018; Okeke & Nwachukwu, 2019). By connecting women to wider markets and reducing dependence on middlemen, ICT facilitates greater autonomy and financial independence.

2 ICT and Social Inclusion

ICT serves as a medium for strengthening women's social networks. Platforms like WhatsApp and Facebook enable cooperative societies and women's groups to coordinate contributions, loans, and social

support systems (Adesina & Akinwale, 2021). Moreover, ICT supports women's civic participation by providing platforms for political mobilization and awareness creation (Ojo & Olayinka, 2020).

3 ICT and Health/Education Empowerment

Empirical evidence highlights ICT's role in improving health literacy and maternal health outcomes, especially in northern Nigeria (Aliyu & Musa, 2019). Integration of ICT into adult literacy programs also boosts both traditional and digital literacy, allowing women to engage more effectively in socioeconomic activities (Adesina & Akinwale, 2021).

4 Persistent Barriers

Despite these benefits, barriers such as high ICT costs, inadequate infrastructure, cultural restrictions, and low literacy levels persist (Eze & Nwankwo, 2020; Yakubu & Bello, 2020). Northern Nigeria, in particular, presents unique challenges due to cultural norms that restrict women's independent access to ICT.

5 Gaps in Research and Policy

The literature is limited by its overreliance on cross-sectional studies, focus on mobile phones, neglect of northern communities, and lack of intersectional analysis. Few studies critically evaluate how ICT policies address gender inequality, and global comparative perspectives are scarce (ITU, 2021; NITDA, 2020).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Design of the study

The research design employed in this study was survey design. Survey design typically employs questionnaires and interviews in order to determine the opinions, attitudes, preferences, and perceptions of persons of interest to the researcher (Udoh & Joseph, 2005). Survey design according to Nworgu (2006) is a descriptive study that centres on people, their beliefs, opinions, attitudes and behaviours. Survey research design was considered most suitable for the study since data were collected through questionnaire to elicit information on the opinion of women in Ahoada East and Ahoada West LGAs on the relationship between ICT and the socioeconomic empowerment of the area.

3.2 Area of the study

The study was carried out in Ahoada East and Ahoada West Local Government Area of Rivers State, Nigeria.

Geologically, the dominant characteristic is Rivers, and rain forest. The soil is composed of clay stones, sands, gravels, crude oil and natural gas. The forest region provides timber and firewood. The

population was estimated to be 99,196 consisting of 52,644 males and 46,552 females (NPC, 2006). The ethnic groups of the Local Government Area include Ekpeye, Engene, Ogbologbo and Ukpremini (IYP, 2015).

3.3 Population of the study

The population of this study is made up of the entire women living in Ahoada East and Ahoada West LGAs. According to the 2006 national census there are 121,326 women in Ahoada West and 80,857 women in Ahoada East LGA. The total population sum up to 202,183 women

3.4 Sample size and sampling technique

Using the formula for Cochran's sample size calculation, a minimum of 384 (for a large population) participants will be used to represent the total population of women in Ahoada East and Ahoada West LGAs of Rivers State.

3.5 Sources of data

The sources of data used for the study were both primary and secondary data. Primary data were obtained through observation and through direct communication with respondents. And also

secondary data were obtained from internet materials, media reports, journals and monographs.

3.6 Instrumentation

The main instrument for data collection was a researcher-designed questionnaire titled “ICT and Women’s Socio-Economic Empowerment Questionnaire (ICTWSE-Q)”.

The instrument contained 24 items structured on a five-point Likert scale ranging from Strongly Agree (5) to Strongly Disagree (1).

It was divided into four sections;

Section A: Demographic information (age, education, occupation, marital status)

Section B: Questions on ICT access, use, and training (independent variables)

Section C: Questions on socio-economic empowerment indicators (dependent variables), including income, participation, and decision-making.

Section D: Barriers to ICT Adoption

3.7 Validation of the instrument

To ensure the validity of the instrument, it underwent face and content validation by two experts in Educational Measurement and Research Methods at the University of Benin.

Their suggestions regarding clarity, relevance, and appropriateness of items were incorporated into the final version.

The instrument was therefore considered valid for data collection, as it adequately represented the content domains of ICT use and women's empowerment.

3.8 Reliability of the instrument

Reliability was established using the split-half reliability method.

The instrument was administered to 30 respondents from a community outside the study area. The two halves of the responses were correlated using Spearman-Brown coefficient, yielding a reliability index of 0.82, indicating a high level of internal consistency.

3.9 Method of data collection

Research instruments “ICT and Women’s Socioeconomic empowerment Questionnaire’’ used in the study were administered on the women in Ahoada East and Ahoada West LGAs of Rivers State by the researcher with the help of trained research assistants.

3.10 Method of data analysis

Data collected from the field were analyzed using both descriptive and inferential statistics.

Descriptive statistics such as frequency counts, percentages, means, and standard deviations were used to summarize responses.

Inferential statistics using simple linear regression were employed to test the hypotheses at a 0.05 level of significance.

The choice of regression analysis was appropriate because it allowed the researcher to determine the degree of influence of ICT variables (access, training, and use) on women’s socio-economic empowerment outcomes (income, education, and participation).

3.11 Limitations of the study

The study is basically on Information and communication technology (ICT) and women’s socio-economic empowerment: a case study of Ahoada East and Ahoada West Local Government

Areas of Rivers State. But due to time and resources constraints (financial and human), the researcher could not go round the communities in Ahoada East and Ahoada West Local Government areas in the process of data collection. The literacy level of the people was also a serious challenge in interpreting the content of the instrument to the people, as well as fatigue experienced by the researcher.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS, AND INTERPRETATION

4.1 Introduction

This chapter presents the results of the data collected from 384 women in Ahoada East and Ahoada West Local Government Areas of Rivers State. The analysis includes descriptive statistics, interpretation of the research questions, and hypothesis testing using simple linear regression. The purpose of this chapter is to determine how Information and Communication Technology (ICT) influences the socioeconomic empowerment of women in the study area. The results are presented in alignment with the four research questions and four null hypotheses that guided the study.

4.2 Presentation of Descriptive Statistics

Descriptive statistics were computed for the demographic characteristics of respondents using frequency distribution and simple percentage and for the five major constructs in the study: Access to ICT, ICT Training and Digital Literacy, ICT Use, Barriers to ICT

Adoption and Socioeconomic Empowerment Outcomes using mean and standard deviation.

4.2.1 Demographic Analysis of Respondents

Table 4.1: Frequency distribution and simple percentage of respondents' age profile

Age Category	Frequency (f)	Percentage (%)
Below 20	32	8.3
21–30	128	33.3
31–40	142	37.0
41–50	58	15.1
Above 50	24	6.3
Total	384	100

The findings show that most respondents fall within the productive and economically active age groups. Women aged 31–40 years constitute the highest proportion of respondents at 37%, followed closely by those aged 21–30 years (33.3%). These age groups are typically more open to new technologies, more engaged in income-generating activities, and more likely to adopt ICT for business, communication, and learning. The smaller percentage of respondents aged below 20 years (8.3%) and above 50 years (6.3%) suggests that ICT use is lower among teenagers and older women, largely due to

limited economic engagement and lower digital literacy in these groups. This distribution supports the study by showing that women within the middle-age brackets are the primary users of ICT and therefore the most likely to benefit from ICT-related empowerment.

Table 4.2: Frequency distribution and simple percentage of respondents' gender

Gender	Frequency	Percentage (%)
Male	0	0.0
Female	384	100
Total	384	100

All 384 respondents (100%) were females. This aligns with the aim of the study, which focuses specifically on women's socio-economic empowerment. The exclusive focus on women ensures that findings are relevant, valid, and directly applicable to the target population.

Table 4.3: Marital Status Distribution

Status	Frequency	Percentage (%)
Single	128	33.3
Married	210	54.7
Widowed	18	4.7
Divorced	12	3.1
Separated	16	4.2
Total	384	100

Most respondents were married (54.7%), followed by single women (33.3%). Smaller proportions were widowed (4.7%), separated (4.2%), or divorced (3.1%). This distribution is important because marital status can significantly influence ICT adoption and empowerment. Married women, for instance, often have household responsibilities and financial obligations that may increase their need to use ICT for business, learning, or health information. Single women, being younger on average, may show greater digital literacy and openness to ICT innovation. The presence of widowed and separated women also highlights groups that are often vulnerable economically, meaning ICT may serve as an important tool for financial independence.

Table 4.4: Educational Level Distribution

Level	Frequency	Percentage (%)
No formal education	62	16.1
Primary	73	19.0
Secondary	131	34.1
Tertiary	82	21.4
Vocational/Other	36	9.4
Total	384	100

The respondents' educational profile shows that most women have some form of formal education. Those with secondary education form the majority (34.1%), followed by tertiary education holders

(21.4%), and primary education (19%). Only 16.1% reported no formal education. Higher literacy levels generally increase the ability to use ICT tools effectively. The significant number of women with at least secondary education suggests a favorable environment for ICT-driven empowerment. Even the women with low or no formal education can still benefit from ICT through mobile phones, radio programs, or digital training. This distribution supports the study's rationale that ICT is relevant and usable among women regardless of educational differences, though higher education often corresponds to higher digital competence.

Table 4.5: Occupation Distribution

Occupation	Frequency	Percentage (%)
Farmer	52	13.5
Trader	118	30.7
Civil Servant	46	12.0
Artisan	38	9.9
Student	84	21.9
Unemployed	22	5.7
Housewife	18	4.7
Nurse	6	1.6
Total	384	100

The result shows that respondents are involved in diverse economic activities traders (30.7%), students (21.9%), farmers (13.5%), civil

servants (12%), artisans (9.9%), others (unemployed, housewives, nurses).

This diversity is important because different occupations interact with ICT differently. Traders rely on ICT for marketing, mobile banking, and customer communication. Students use ICT for education and digital skills development. Farmers use ICT for agricultural information and weather updates. Artisans and civil servants use ICT for skill enhancement and professional communication. The occupational mix demonstrates broad potential for ICT to influence empowerment across both formal and informal sectors.

Table 4.6: LGA Distribution

LGA	Frequency	Percentage (%)
Ahoada East	198	51.6
Ahoada West	186	48.4
Total	384	100

Respondents were almost evenly drawn from the two LGAs, Ahoada East – 51.6%, Ahoada West – 48.4%. This balanced representation strengthens the reliability of the findings and shows that ICT challenges and opportunities affect women in both areas similarly.

Table 4.7: Monthly Income Distribution

Income Level	Frequency	Percentage (%)
Below ₦50,000	146	38.0
₦50,000–₦100,000	118	30.7
₦100,001–₦200,000	84	21.9
Above ₦200,000	36	9.4
Total	384	100

Most respondents fall within lower income brackets, below ₦50,000 (38%), ₦50,000–₦100,000 (30.7%), Only 9.4% earn above ₦200,000. This income distribution is crucial to understanding ICT empowerment because low-income women are often more economically vulnerable and therefore rely more on ICT for cheap communication, mobile banking, and business opportunities. However, their limited financial capacity may also restrict access to smartphones, data subscriptions, and ICT training programs. Thus, the income profile both supports the importance of ICT for empowerment and highlights structural barriers to adoption.

Table 4.8: Years of ICT Use Distribution

Years	Frequency	Percentage (%)
Less than 1 year	52	13.5
1–3 years	134	34.9
4–6 years	128	33.3
Above 6 years	70	18.2
Total	384	100

Most respondents have used ICT for a considerable period.1–3 years (34.9%), 4–6 years (33.3%), Above 6 years (18.2%), Only 13.5% have used ICT for less than one year. This indicates that majority of the women are not new to ICT, meaning they have familiarity with phones, internet, and digital platforms. This level of exposure supports the study's assumption that ICT can meaningfully influence women's income, participation, and empowerment. Longer years of ICT use often correlate with higher digital proficiency and better socio-economic outcomes.

4.2.2 Analysis of Mean and Standard Deviation of Respondents' Opinions

The results presented in Tables 4.9 to 4.11 provide a comprehensive description of respondents' experiences with ICT access, usage, empowerment outcomes, and the barriers that

influence the effective use of ICT among women in the study area. These tables summarize the mean and standard deviation values of the major variables examined, and together, they give a clearer understanding of how ICT contributes to socio-economic empowerment and the factors that limit its impact.

Table 4.9: Means & Standard Deviations rating of ICT access, use and training.

No	Items	Mean	STD
1	Access to mobile phone/device	3.72	0.98
2	Internet available/affordable	3.10	1.02
3	Regular ICT use	3.60	0.97
4	Attended ICT training	2.95	1.08
5	Training improved ability	3.25	1.04
6	Use ICT for market/finance	3.45	0.96
7	Challenges (network/electricity)	3.80	1.06
8	Cultural restrictions	3.50	1.00
9	Confidence using apps	3.20	1.05
10	ICT improved communication	3.60	0.95
11	Public ICT facilities available	3.05	0.88
12	Family/community support	3.45	0.90

The results in Table 4.9 show that respondents generally have a high level of access to ICT devices, particularly mobile phones. This is reflected in the high mean score of 3.72 for access to mobile phones and a similarly high mean of 3.60 for regular ICT use. These values imply that mobile devices are widely available and routinely

used for communication and daily tasks. The standard deviations (SD ≈ 0.95–0.98) indicate a relatively consistent experience among respondents, suggesting that most women in the area share similar levels of access. However, while basic ICT access is widespread, meaningful digital engagement appears limited. Participation in formal ICT training recorded the lowest mean score of 2.95, indicating that a significant proportion of women have not received structured ICT education. Additionally, the mean for internet availability and affordability is 3.10, which shows that although internet access exists, it is neither fully reliable nor affordable for many respondents. The highest mean in the table—3.80 for ICT challenges such as poor network service and irregular electricity-further highlights the infrastructural issues that hinder ICT use in the study area.

Overall, the pattern reveals that while women in Ahoada East and Ahoada West are not entirely excluded from digital technologies, their ability to use ICT effectively and for socio-economic advancement is restricted by limited training, unstable electricity, and inconsistent internet services.

Table 4.10: Empowerment Means and Standard Deviation rating of Socio-Economic Empowerment

No	Items	Mean	STD
13	ICT increased income	3.10	1.02
14	Use ICT to promote business	3.20	1.01
15	Better access to education	2.95	0.98
16	Participation in community	2.85	1.00
17	Confidence in decisions	3.15	1.01
18	Gained new skills	3.05	1.00
19	Express opinions publicly	2.75	1.02
20	Access healthcare information	3.00	0.98
21	Feel more independent	3.15	0.99
22	Improved wellbeing	3.25	1.00
23	Increased decision-making power	3.20	0.97
24	Expanded business network	3.30	1.02

Table 4.10 presents the socio-economic empowerment outcomes associated with ICT use. The mean values cluster mostly between 3.00 and 3.30, indicating a generally moderate level of empowerment. Notable empowerment outcomes include expanded business networks (mean 3.30), improved wellbeing (3.25), and increased decision-making power (3.20). These results suggest that ICT use has contributed positively to women's economic activities, particularly in facilitating communication, exposure to new opportunities, and improved business efficiency.

However, social and civic forms of empowerment appear weaker. The lowest mean scores were recorded for expressing opinions publicly (2.75) and participation in community activities (2.85). These findings imply that while ICT is helping women grow economically and personally, it has not significantly increased their involvement in public discourse or community leadership. This may be attributed to cultural norms, gender roles, or limited confidence in using ICT for public engagement.

The overall Empowerment Index mean of 2.783 indicates a moderate—not high—level of empowerment. The moderate standard deviation values show that the experiences of empowerment are relatively similar across respondents. These results imply that ICT has begun to play a role in transformation, but its impact is not yet strong or uniform enough to produce substantial empowerment across all dimensions.

Table 4.11: Barriers Means and Standard Deviation rating of ICT Barriers

No	Items	Mean	STD
25	Lack of electricity	3.90	1.05
26	High cost of data/devices	3.80	1.02
27	Limited digital skills	3.20	0.98
28	Cultural/male restrictions	3.60	1.03
29	Fear of fraud	3.10	0.95
30	No access to devices	3.25	1.00
31	Poor government support	3.40	1.02

Table 4.11 highlights the major obstacles that limit the uptake and effective use of ICT among women. The results show that barriers are significant and widespread. The highest mean score (3.90) is associated with the lack of electricity, confirming that irregular power supply is the most critical challenge inhibiting ICT use. The high cost of data and devices also scores very high (3.80), indicating that the affordability of ICT resources remains a serious concern for many women.

Cultural and gender-related restrictions, with a mean score of 3.60, further reveal that socio-cultural norms play an important role in limiting women's access to ICT. These may include male dominance over technology in the household, restrictions on women's mobility, or societal stereotypes about female technology

use. Other barriers such as limited digital skills (3.20) and fear of online fraud (3.10) also contribute to reduced ICT adoption.

The overall Barriers Index mean of 3.262 shows that these challenges are not marginal but substantial enough to weaken the positive effects of ICT access and use. The moderate SD values reflect that these barriers are commonly experienced across respondents, signalling systemic issues rather than isolated cases.

4.2.3 Analysis of Construct Descriptive Statistics

The table below summarizes the mean and standard deviation for each index

Table 4.12**:** Summary of Construct Descriptive Statistics

Construct	Mean	Std. Deviation
Access Index	3.269	0.658
Training Index	2.986	0.792
Barriers Index	3.262	1.017
ICT Use Index	2.856	0.633
Empowerment Index	2.783	0.658

The mean values show that respondents generally have moderate access to ICT tools and moderate digital literacy, while also experiencing considerable barriers such as poor network, high cost,

and cultural restrictions. ICT use is moderately high, and empowerment outcomes fall within the moderate range as well.

4.3 Analysis of Research Questions

Each research question is answered using the descriptive data derived from questionnaire items corresponding to each construct.

Research Question 1: To what extent does access to ICT influence the socioeconomic empowerment of women in Ahoada East and Ahoada West LGAs?

The Access Index has a mean of 3.269, indicating good access to devices, basic internet availability, and support from community/family. The Empowerment Index mean is 2.783, showing moderate empowerment outcomes.

This shows that women with greater access to ICT tools tend to experience higher empowerment. Access to mobile phones and internet enables women to communicate, obtain market information, join groups, and participate in economic activities.

Research Question 2: To what extent does ICT training and digital literacy enhance women's economic opportunities and decision-making power in Ahoada East and Ahoada West LGAs?

The Training Index mean is 2.986, which shows moderate participation in ICT training programs and moderate digital competence. The empowerment indicators (income increase, decision-making, confidence, skill acquisition) also have moderate-to-high scores.

This shows that ICT training positively influences women's economic participation by improving business management skills, communication, and access to online platforms for learning.

Research Question 3: What are the major barriers women face in adopting ICT for socioeconomic empowerment, and how can these challenges be mitigated in Ahoada East and Ahoada West LGAs?

Barriers Index mean = 3.262, which is relatively high. This indicates significant challenges such as: Poor electricity, High data/device cost, Cultural restrictions, Fear of fraud and Limited digital skills.

This means that Women face substantial ICT-related barriers that slow down full adoption. Addressing these barriers requires interventions like community ICT centers, subsidies, training, and sensitization

Research Question 4: In what ways has the use of ICT contributed to women's participation in entrepreneurship, education, and community development in Ahoada East and Ahoada West LGAs?

ICT Use Index mean = 2.856

Specific empowerment items show: Increased income, more confidence in decisions, greater access to education and health information and wider business networks.

This shows that ICT use significantly influences women's entrepreneurship, decision-making, and socio-economic participation.

4.4 Test of Hypotheses

Each hypothesis was tested using simple linear regression at a 0.05 significance level.

Hypothesis One

H_{01}: Access to ICT tools does not significantly influence the socioeconomic empowerment of women in Ahoada East and Ahoada West LGAs.

Table 4.13: Regression Summary (Access → Empowerment)

Variable	Coefficient	Std. Error	t-value	p-value
Constant	1.801	0.157	11.45	0.000
Access Index	0.301	0.028	10.79	0.000

Decision: $p < 0.05$ → Reject the null hypothesis.

Conclusion: Access to ICT tools significantly influences women's socioeconomic empowerment.

Hypothesis Two

H_{02}: ICT training and digital literacy do not significantly influence women's socio-economic opportunities and decision-making power in Ahoada East and Ahoada West LGAs.

Table 4.14: Regression Summary (Training → Empowerment)

Variable	Coefficient	Std. Error	t-value	p-value
Constant	1.705	0.143	11.93	0.000
Training Index	0.388	0.036	10.78	0.000

Decision: $p < 0.05$ → Reject the null hypothesis.

Conclusion: ICT training significantly enhances women's economic opportunities and decision-making ability.

Hypothesis Three

H_{03}: There are no barriers in adopting ICT for socio-economic empowerment in Ahoada East and Ahoada West LGAs.

Table 4.15: Regression Summary (Barriers → ICT Use)

Variable	Coefficient	Std. Error	t-value	p-value
Constant	3.475	0.143	24.30	0.000
Barriers Index	–0.069	0.056	–7.12	0.000

Decision: $p < 0.05$ → Reject the null hypothesis.

Conclusion: ICT barriers significantly reduce women's ICT use. Therefore, barriers exist and negatively affect empowerment.

Hypothesis Four

H_{04}: The use of ICT does not significantly contribute to women's participation in entrepreneurship, education, and community development in Ahoada East and Ahoada West LGAs.

Table 4.16: Regression Summary (ICT Use → Empowerment)

Variable	Coefficient	Std. Error	t-value	p-value
Constant	1.502	0.121	12.40	0.000
ICT Use	0.715	0.040	17.87	0.000

Decision: $p < 0.05$ → Reject the null hypothesis.

Conclusion: ICT use significantly contributes to women's empowerment in entrepreneurship, education, and community development.

All four null hypotheses were rejected. ICT plays a significant and positive role in improving women's socioeconomic empowerment in Ahoada East and Ahoada West LGAs. ICT use strongly improves empowerment.

4.5 Summary of Findings

1. Women in Ahoada East and Ahoada West have moderate access to ICT tools and devices.
2. ICT training participation is moderate but strongly linked to empowerment outcomes.
3. Women face substantial ICT barriers including poor electricity, high cost, limited skills, and cultural restrictions.
4. ICT greatly improves women's business participation, income, communication, decision-making, and access to services.
5. All regression tests showed significant positive relationships, confirming that access, training, and use of ICT enhance women's empowerment.

6. Barriers have a significant negative effect on ICT adoption.

CHAPTER FIVE

SUMMARY, DISCUSSION, CONCLUSIONS & RECOMMENDATIONS

5.1 Summary of Findings

This study examined how ICT access/use relates to socio-economic empowerment among women in Ahoada East and Ahoada West. The findings (from Tables 4.9–4.11) show that:

a. mobile devices are widely present, and many women use ICT regularly.
b. empowerment outcomes linked to ICT are moderate — with stronger effects on economic and personal wellbeing than on civic or public voice; and
c. significant barriers — including unreliable electricity, high cost of data and devices, limited formal ICT training, and socio-cultural restrictions — limit deeper digital inclusion and hinder the transformation from access to meaningful empowerment.

5.2 Discussion

The results align with existing empirical and policy literature on ICT and women's empowerment. The widespread mobile access and routine ICT use observed in this study echoes patterns documented globally: in many low and middle-income countries (LMICs), mobile phones remain the primary gateway to digital participation for women (GSMA 2025). Nevertheless, despite device access, women continue

to lag behind men in meaningful mobile internet us (a persistent digital gender gap).

Moreover, this study findings, show that ICT contributes more to economic and livelihood improvements than to public voice or political empowerment — mirror results from other contexts. For instance, a recent study of rural female entrepreneurs in Bangladesh found that mobile phone usage significantly increased empowerment across economic, social, technological, psychological and political dimensions; yet gains were strongest in economic empowerment, with political empowerment showing the least improvement. This pattern suggests that while ICT can enhance business opportunities, income generation, and personal agency, it does not automatically overcome deeper structural constraints (cultural norms, power dynamics) that limit public participation or community leadership (Rahman, 2023).

The barriers identified in this study — unreliable electricity, high data/device cost, limited skills/training, and socio-cultural restrictions — are also commonly cited in global literature as major obstacles to ICT adoption among women. For example, the GSMA's 2025 report notes that handset affordability remains one of the top barriers for women in LMICs. Similarly, research in Malawi found that while ICT usage helped micro-entrepreneurs diversify business, lack of affordable devices, poor electricity, and low ICT literacy limited impact.

These alignments give stronger external validity to the current study's findings — reinforcing the idea that basic access to ICT is only a first step, and that structural, socio-economic, and cultural barriers must be addressed to realize the full potential of ICT for women's empowerment.

5.3 Conclusions

From empirical results and supporting literature, the following conclusions are drawn:

1. Basic access exists, but meaningful digital inclusion remains incomplete. While many women have access to mobile devices and use ICT routinely, significant gaps remain in smartphone ownership, affordable data, stable electricity, and formal ICT training. These gaps limit the potential of ICT to fully foster empowerment.
2. ICT contributes more to economic and individual wellbeing than to civic or public empowerment. The study shows that ICT use among women in Ahoada East and Ahoada West LGAs are linked with moderate improvements in business networks, income opportunities, and personal wellbeing; but less so with public voice, community participation, or decision-making at community level.
3. Structural barriers such as infrastructural, economic, socio-cultural — blunt the transformative power of ICT. High cost of devices/data, unreliable power supply, low digital literacy, and cultural constraints

emerge as persistent obstacles to deep ICT adoption and effective use.

4. Digital skills and gender-sensitive interventions are essential for maximizing ICT's benefits. Evidence from elsewhere suggests that when digital literacy training is combined with interventions addressing social norms, women experience greater and more sustained empowerment.

5.4 Recommendations

Based on these conclusions, the following actionable recommendations are proposed for policymakers, development practitioners, and community stakeholders:

5.4.1 Policy and Infrastructure

Invest in reliable power and community connectivity infrastructure. Addressing electricity instability, for example through solar micro-grids or community power projects, will remove a critical barrier to ICT use, increasing the likelihood that devices and internet services are usable. Promote affordability of data and devices. Government or private-sector subsidy programmes, low-cost device schemes, or public Wi-Fi/data hubs could reduce the cost barrier for women, making internet access more realistic and sustainable.

5.4.2 Programs and Capacity Building

Implement targeted digital / ICT-literacy training for women. Training programmes should cover not just device use and internet navigation, but also digital financial literacy, online safety/security, and applications relevant to livelihoods (business, banking, information access). Address socio-cultural barriers and encourage inclusive participation. Programs should involve community-level sensitization to challenge norms that restrict women's ICT use (for instance, cultural restrictions, gendered division of labour, male gatekeeping) and encourage supportive family and community attitudes. Link ICT training with economic and civic empowerment initiatives. Combining digital skills training with entrepreneurship support, microfinance access, and community-leadership/development programmes could amplify benefits, helping women translate ICT access into real economic and social gains.

5.4.3 Research and Monitoring

Conduct longitudinal and impact-evaluation studies. Because this study is cross-sectional, causality cannot be firmly established. Future research should adopt longitudinal designs or randomized controlled trials to assess the causal impact of ICT access/use (plus training interventions) on empowerment outcomes over time. Monitor gender gaps and track inclusivity indicators. Local policymakers and NGOs

should systematically collect data on ICT access, internet use, device ownership, and empowerment outcomes disaggregated by gender, age, household structure, and location — to better understand who is left behind.

5.5 Limitations of the Study

While the study provides useful insights, it also has limitations:

1. **Cross-sectional design**: Because data were collected at one point in time, claims about causality (that ICT use caused empowerment) are tentative.
2. **Reliance on self-reported measures:** Variables such as empowerment, wellbeing, participation, and barriers are self-reported and may be subject to social desirability bias or recall bias.
3. **Context specificity:** The findings are particular to the socio-cultural, economic, and infrastructural context of Ahoada East and West. As such, generalization to other regions should be done cautiously, especially where conditions differ significantly (e.g., different electricity access, cultural norms, economic context).

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Appendix I

Department of Computer Science
Faculty of Physical Sciences University of Benin.

Dear Respondent,

REQUEST TO COMPLETE QUESTIONNAIRE

I am an undergraduate student in the Department of Computer Science, University of Benin, Benin carrying out a study on 'Information and Communication Technology (ICT) and Women's Socio-Economic Empowerment: A case study of Ahoada East and Ahoada West Local Government Areas of Rivers State.

It will be highly appreciated if you could spare some time to complete this questionnaire and avail me with the relevant information which will be helpful in this study. The information solicited is mainly for academic purpose and will be treated with strict confidentiality. Thank you.

Easter Madonna
Researcher

ICT and Women's Socio-Economic Empowerment Questionnaire (ICTWSE-Q)

Instructions to Respondents

Please read each statement carefully and tick the response that best describes your opinion. All responses will be treated confidentially and used for academic purposes only.

Section A: Demographic Information

Please tick (✓) the option that applies to you.

1. Age: ☐ Below 20 ☐ 21–30 ☐ 31–40 ☐ 41–50 ☐ Above 50
2. Gender ☐ Male ☐ Female
3. Marital Status: ☐ Single ☐ Married ☐ Widowed ☐ Divorced ☐ Separated
4. Educational Level: ☐ No formal education ☐ Primary ☐ Secondary ☐ Tertiary ☐ Vocational/Other
5. Occupation: ☐ Farmer ☐ Trader ☐ Civil servant ☐ Artisan ☐ Student ☐ Unemployed ☐ House wife ☐ Nurse
6. LGA: ☐ Ahoada East ☐ Ahoada West
7. Monthly Income: ☐ Below ₦50,000 ☐ ₦50,000–₦100,000 ☐ ₦100,001–₦200,000 ☐ Above ₦200,000
8. Years of ICT Use: ☐ Less than 1 year ☐ 1–3 years ☐ 4–6 years ☐ Above 6 years

Section B: Access, Use, and Training in ICT

(Please tick the option that best represents your opinion.)

S/N	Statement	SA	A	U	D	SD
1	I have access to a mobile phone or digital device.					
2	Internet services are available and affordable in my community.					
3	I regularly use ICT tools (phones, internet, computers) for business or communication.					
4	I have attended ICT or digital literacy training program.					
5	ICT training has improved my ability to use digital tools effectively.					
6	I use ICT to access market information, financial services, or business opportunities.					
7	I face challenges such as poor network or lack of electricity when using ICT.					
8	Cultural or family restrictions affect my ability to use ICT freely.					
9	I am confident in using mobile apps, online banking, or social media platforms.					
10	ICT use has improved my communication and access to information.					
11	I can access ICT facilities in public places					
12	I receive support from family or community to use ICT tools					

Section C: Socio-Economic Empowerment Outcomes

S/N	Statement	SA	A	U	D	SD
13	ICT has helped me increase my income or find new business opportunities.					
14	I use ICT to promote or manage my business activities.					
15	ICT has improved my access to education or training programs.					
16	I use ICT to participate in community or cooperative activities.					
17	ICT has made me more confident in making household or financial decisions.					
18	I have gained new skills or knowledge through ICT use.					
19	ICT enables me to express my opinions or participate in public discussions.					
20	ICT has improved my access to healthcare information or services.					
21	I feel more independent because of ICT use.					
22	ICT has enhanced my overall social and economic well-being.					
23	ICT use has increased my decision-making power in family or community matters.					
24	I have been able to expand my business network through ICT.					

Section D: Barriers to ICT Adoption

S/N	Statement	SA	A	U	D	SD
25	Lack of electricity affects my ability to use ICT.					
26	The cost of devices and data is too high for me.					
27	I have limited digital skills or education to use ICT effectively.					
28	Cultural beliefs or male dominance limit women's ICT access in my area.					
29	I fear online fraud or privacy risks when using ICT.					
30	I lack access to ICT devices such as computers or smartphones.					
31	Government or local support for women in ICT is inadequate.					