

**THE ROLE OF ASSISTIVE TECHNOLOGY IN ENHANCING DIGITAL SKILLS  
ACQUISITION AMONG PHYSICALLY CHALLENGED PERSONS IN NIGERIA**

**BY**

**OGIEMWONYI GLORY**

**PSC1813850**

**A PROJECT REPORT SUBMITTED TO THE DEPARTMENT OF COMPUTER  
SCIENCE, FACULTY OF COMPUTING, UNIVERSITY OF BENIN, BENIN CITY**

**IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF A  
BACHELOR OF SCIENCE (B.Sc.) DEGREE IN COMPUTER SCIENCE**

**JANUARY 2026**

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## **CERTIFICATION**

This is to certify that this project work was carried out by **OGIEMWONYI GLORY** with Matriculation Number **PSC1813850** under my supervision. It is adequate and satisfactory, both in scope and content, for the award of Bachelor of Science (B.sc) Degree in Computer Science of the University of Benin.

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**DR. K. O. OTOKITI**

(Project  
Supervisor)

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**DATE**

## **APPROVAL**

This project work is hereby approved in partial fulfilment of the requirements for the award of Bachelor of Science (B.Sc.) Degree in Computer Science from the University of Benin.

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**DR. (MRS.) R.A. USIOBAIFO**

Head of Department

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**DATE**

## **DEDICATION**

This project is dedicated to God for giving me the strength and wisdom to see it through to completion, and even throughout my stay in the University of Benin (UNIBEN). It is also dedicated to my Parents: Mr and Mrs Charles Ogiemwonyi, my Beloved Husband Mr Courage Leleji and pastor Godspower Ndidi Isibor Okudei for their love, support and guidance throughout my academic journey.

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## ABSTRACT

This study titled “*A Study on the Role of Assistive Technology in Enhancing Digital Skills Acquisition Among Physically Challenged Persons*” investigates how assistive technologies influence digital learning, productivity, and inclusion among physically challenged Persons in the Ugbowo–Egor axis of Benin City, Edo State. The study employed a descriptive survey design, with data collected through structured questionnaires administered to 100 Persons, of which 90 valid responses were analyzed using descriptive and inferential statistics (SPSS v26). Findings revealed a moderate level of awareness of assistive technologies but low accessibility due to cost, inadequate awareness, and poor infrastructural support. Despite these challenges, results showed that the use of assistive tools such as voice commands, adaptive keyboards, and screen readers significantly improved Persons’ digital learning outcomes, confidence, and productivity. Correlation analysis ( $r = 0.684$ ,  $p < 0.05$ ) confirmed a strong positive relationship between assistive technology use and digital skill acquisition. The study concludes that assistive technologies are critical enablers of digital inclusion and economic empowerment for persons with disabilities. It recommends targeted government funding, awareness campaigns, inclusive ICT training, and the development of affordable, locally adaptable assistive tools to bridge the accessibility gap and advance sustainable digital participation for physically challenged Persons.

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# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of the Study

In the twenty-first century, the acquisition of digital skills has become one of the most essential determinants of economic empowerment, social inclusion, and personal growth. Digital literacy defined as the ability to effectively and critically navigate, evaluate, and create information using digital technologies plays a crucial role in today's knowledge-driven economy (Adebayo & Musa, 2021). For Persons, particularly those involved in informal sectors such as tailoring, shoemaking, carpentry, and hairdressing, digital competence provides new opportunities to expand their market reach, advertise services through social media, and access e-learning resources for skill improvement.

However, despite the global emphasis on digital inclusion, many individuals living with physical disabilities remain digitally marginalized. This digital divide often stems from infrastructural limitations, societal stigma, and the lack of adaptive tools that accommodate physical impairments. According to the World Health Organization (WHO, 2021), over one billion people globally live with some form of disability, yet only a small fraction have adequate access to technologies that facilitate their participation in education and economic activities. Within this population, Persons with physical disabilities represent a critical but underexplored group whose capacity for digital learning and entrepreneurship is hindered by barriers to accessibility.

Assistive technology (AT) has emerged as one of the most impactful innovations aimed at closing this gap. The term "assistive technology" refers to any device, system, or software specifically designed to maintain, improve, or enhance the functional capabilities of individuals

with disabilities (UNESCO, 2020). These technologies range from hardware devices such as screen readers, adaptive keyboards, and prosthetic input systems to software tools that convert speech to text, magnify visuals, or enable gesture-based navigation. When effectively integrated into learning and work environments, assistive technologies empower persons with disabilities to perform tasks that would otherwise be difficult or impossible (Okoro & Salawu, 2022).

For physically challenged Persons, the relevance of assistive technologies extends beyond personal convenience; it represents a pathway to economic independence and digital empowerment. In the context of Nigeria and other developing countries, where unemployment rates among people with disabilities remain high, access to digital skills through assistive technologies can open doors to online business, remote work, and e-learning platforms. Tools like voice recognition software, adaptive design interfaces, and mobile-based educational apps can enable these Persons to learn digital marketing, financial management, and product design skills that are vital in a technology-driven economy (Edeh & Akpan, 2021).

Nevertheless, despite the promise of assistive technologies, several challenges persist in their adoption and utilization. Cost barriers, lack of awareness, and inadequate government support remain critical limitations in Nigeria (Akinola, 2020). Furthermore, there is limited empirical evidence on how these technologies influence the digital learning outcomes of physically challenged Persons particularly those in informal vocational sectors. This research, therefore, seeks to bridge that knowledge gap by examining the role of assistive technology in enhancing digital skills acquisition among physically challenged Persons, with a focus on accessibility, impact, and implementation challenges.

In essence, the study aims to uncover how assistive technologies serve as catalysts for digital inclusion, empowering physically challenged Persons to participate fully in the digital economy. By doing so, it contributes to the global discourse on sustainable development and inclusive innovation as outlined in the United Nations Sustainable Development Goals (SDGs), specifically SDG 4 (Quality Education), SDG 8 (Decent Work and Economic Growth), and SDG 10 (Reduced Inequalities).

## **1.2 Statement of the Problem**

In the modern digital age, proficiency in digital tools has become indispensable for personal advancement, social connectivity, and professional growth. Yet, despite increased emphasis on digital literacy, individuals with physical disabilities particularly Persons engaged in vocational trades remain underrepresented in digital empowerment initiatives. The digital divide between able-bodied individuals and physically challenged Persons is often widened by inaccessible platforms, limited availability of assistive technologies, and lack of training opportunities tailored to their needs (Oyeleke & Salawu, 2022).

While assistive technologies exist to mitigate these challenges, their adoption and integration within Nigeria's person community remain low. This can be attributed to factors such as high costs, lack of technical knowledge, and limited institutional support for disability-focused technological interventions. Consequently, physically challenged Persons struggle to access online tutorials, digital business tools, and virtual training programs that could significantly improve their craft and income generation potential.

Moreover, most existing studies on digital inclusion in Nigeria have focused on students in formal education settings, leaving a gap in understanding how assistive technologies impact

informal sectors like person trades. Without adequate research and data, policymakers, NGOs, and technology developers are unable to design interventions that truly address the digital needs of Persons with physical disabilities.

Hence, this study is motivated by the need to understand and document the specific role of assistive technologies in supporting digital skills acquisition among physically challenged Persons, the extent to which these technologies are accessible and utilized, and the challenges faced in their adoption. Addressing these issues is crucial to promoting equitable access to digital literacy and fostering inclusive socio-economic development.

### **1.3 Aim and Objectives of the Study**

The primary aim of this study is to examine the role of assistive technology in enhancing digital skills acquisition among physically challenged Persons in Nigeria. The Specific Objectives of the study are as follows:

- i. To identify the types and availability of assistive technologies used by physically challenged Persons.
- ii. To assess how these assistive technologies influence digital skills acquisition and learning outcomes.
- iii. To explore the challenges physically challenged Persons face in accessing and effectively using assistive technologies.

### **1.4 Research Questions**

To guide the direction and depth of this study, the following research questions are formulated:

- i. What types of assistive technologies are available and commonly used by physically challenged Persons for digital skill development?
- ii. How do assistive technologies influence the acquisition and improvement of digital skills among physically challenged Persons?
- iii. What specific challenges hinder physically challenged Persons from accessing and effectively utilizing assistive technologies for digital learning and productivity?

These research questions are designed to establish a systematic inquiry into the intersection between disability, technology, and skill acquisition. They provide a framework for analyzing the current realities faced by Persons with disabilities, the technological tools available to them, and the practical implications of those tools in enhancing their livelihoods. The answers derived from these questions will not only illuminate existing gaps in digital inclusivity but also serve as a foundation for policy recommendations and future technological interventions.

### **1.5 Significance of the Study**

The significance of this study is outlined as follows:

1. The study contributes to academic knowledge by providing empirical information on the role of assistive technology in digital skills acquisition among physically challenged Persons, an area that has received limited research attention.
2. The study provides useful insights for technology developers and system designers on how assistive technologies can be used to enhance accessibility and usability of digital tools for persons with physical disabilities.

3. The findings of the study will help physically challenged Persons understand the importance of assistive technologies in improving their digital skills, productivity, and participation in the digital economy.
4. The study will serve as a guide for government agencies, non-governmental organizations, and vocational training centers in designing inclusive digital literacy and assistive technology programs for persons with disabilities.
5. The study supports social inclusion by promoting awareness of the digital challenges faced by physically challenged Persons and encouraging equal access to digital opportunities and economic empowerment.

### **1.6 Scope of the Study**

1. The research centers on examining the role of assistive technologies in enhancing digital skills acquisition among physically challenged Persons within the context of Nigeria's informal sector.
2. The scope is deliberately defined to ensure focus, depth, and practical relevance.

### **1.7 Limitations of the Study**

Every research has inherent constraints that may affect the extent of its generalization, and this study is not an exception. One of the major limitations anticipated in this research is the availability of accurate data from physically challenged Persons. Many Persons operate informally and may not keep structured records of their digital training or the assistive tools they use, which could limit the comprehensiveness of data collection.

Another significant limitation is geographical coverage. Due to financial and time constraints, the study may not be able to reach all regions or states where physically challenged Persons

operate. As a result, the research will focus primarily on a few accessible urban and semi-urban locations. Although this may restrict the generalizability of the findings, efforts will be made to select participants that fairly represent the wider population.

Furthermore, the study may face challenges relating to technological awareness and literacy levels among respondents. Some participants may have limited understanding of assistive technology or digital concepts, making it difficult to obtain in-depth responses. To address this, the researcher will simplify explanations during interviews and questionnaires, ensuring that participants fully grasp the questions.

Finally, financial and logistical limitations, including transportation, printing of questionnaires, and access to digital devices, may pose practical challenges. Despite these constraints, the researcher will ensure that the study maintains its academic rigor, validity, and reliability through careful planning and the use of appropriate research instruments.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Concept of Assistive Technology

Assistive technology (AT) has been described as any system, device, or application that enhances the functional capabilities of individuals with disabilities and enables them to participate more fully in social, educational, or economic activities (World Health Organization [WHO], 2022). The term covers a wide spectrum of tools ranging from basic aids, such as magnifiers and mobility devices, to sophisticated digital systems like screen readers, speech-recognition software, and adaptive keyboards. According to UNESCO (2023), assistive technologies play a central role in promoting inclusive education and lifelong learning opportunities, helping people with disabilities overcome barriers that limit access to information and skills development.

In essence, assistive technology operates as a bridge between impairment and functionality. For physically challenged Persons, AT transforms traditional barriers into manageable challenges, offering the means to perform complex tasks more independently. The World Health Organization and UNICEF (2022) note that access to assistive technology contributes to economic productivity, self-reliance, and improved quality of life for people with disabilities. This view aligns with the inclusive innovation framework, which emphasizes the creation and use of technology to support marginalized or underrepresented groups in society (Edeh & Akpan, 2021).

The conceptual understanding of AT has also evolved from being merely a rehabilitation or medical intervention to becoming a social and economic empowerment tool. As highlighted by Okonji and Ogwezzy (2019), assistive technologies are now recognized as instruments for

equality, allowing persons with disabilities to compete favorably in the digital workspace. In the context of digital learning and vocational training, assistive technology facilitates active participation by adapting digital platforms to individual needs such as providing voice feedback, tactile interfaces, or simplified navigation for people with mobility challenges (Akinola, 2020).

In Nigeria, the adoption of assistive technologies remains relatively low due to affordability issues, lack of awareness, and inadequate government support structures (Oyeleke & Salawu, 2022). However, the growing use of smartphones and internet-based tools has created opportunities for affordable assistive solutions through mobile applications and accessible design principles. Modern operating systems like Android and iOS now come with built-in accessibility features, such as text-to-speech readers and voice control systems, which can significantly enhance digital skills acquisition for people with physical impairments (GSMA, 2021).

Thus, assistive technology represents not just a set of tools but a pathway to empowerment and inclusion. For physically challenged Persons, it can mean the difference between economic dependency and entrepreneurial freedom.

### **2.1.1 Types and Categories of Assistive Technologies**

Assistive technologies are diverse and can be categorized in several ways, including by complexity, function, and purpose. According to WHO (2022), assistive products can be grouped into low-tech, medium-tech, and high-tech solutions, depending on their level of sophistication and cost.

#### **1. Low-Tech Assistive Tools:**

These are simple, inexpensive devices that do not require electricity or digital integration.

Examples include modified scissors, large-grip tools, or sewing machine adaptors for

Persons with limited hand function. These tools are vital in vocational trades where affordability and simplicity are key (UNESCO, 2023).

## 2. Medium-Tech Tools:

These include devices that may require limited power or software support but remain relatively affordable. Examples include handheld magnifiers, portable audio recorders, and mechanical input aids. Such technologies are especially relevant for Persons learning through demonstrations or audio-based tutorials (Edeh & Akpan, 2021).

## 3. High-Tech Assistive Technologies:

These are advanced systems incorporating digital or electronic components, such as screen readers, voice recognition software, text-to-speech engines, or customized adaptive keyboards (GSMA, 2021). These tools enable users with severe mobility or dexterity limitations to operate computers, smartphones, and other digital devices efficiently.

In addition to these classifications, assistive technologies can also be divided by functional domains (Okonji & Ogwezzy, 2019; WHO, 2022):

- **Input and Control Devices:** Such as adaptive keyboards, switch systems, touch screens, and eye-tracking devices, which allow users to interact with digital content even with minimal physical movement.
- **Output and Display Devices:** These include screen magnifiers, audio output systems, and Braille displays that help users receive and process information in accessible formats.

- Software and Applications: These consist of mobile and desktop applications that enhance accessibility such as text readers, voice assistants, and language simplification tools.
- Communication Aids: Including augmentative and alternative communication (AAC) systems that support users in expressing themselves effectively.

Recent studies emphasize the growing role of mobile-based assistive applications in bridging the accessibility gap in developing countries. For instance, smartphone applications like Voice Access, TalkBack, and Apple's VoiceOver have become transformative for people with disabilities, enabling them to learn, navigate, and create digital content more independently (UNESCO, 2023; WHO, 2022). The availability of these tools on widely used devices like Android phones also enhances scalability and affordability for Persons operating in informal sectors.

Moreover, locally fabricated assistive devices are gaining attention across Africa as cost-effective and culturally appropriate alternatives to imported technologies. Community-based innovation programs have successfully designed adaptive sewing kits, one-handed cutting tools, and simplified user interfaces for Persons (Oyeleke & Salawu, 2022). These localized approaches not only promote inclusion but also stimulate indigenous innovation and skill development.

In conclusion, the classification and use of assistive technologies demonstrate that inclusion is possible at multiple levels. From simple mechanical tools to advanced AI-powered systems, each category plays a role in promoting accessibility and digital empowerment. For physically challenged Persons, the focus should be on ensuring that assistive technologies are affordable,

adaptable, and relevant to their craft and environment. When this is achieved, AT becomes not just a support system but a catalyst for economic transformation.

### **2.1.2 Concept of Digital Skills Acquisition**

Digital skills acquisition refers to the process through which individuals develop the ability to use information and communication technologies (ICTs) to access, evaluate, create, and share information in productive and meaningful ways. According to UNESCO (2021), digital skills encompass a wide range of competencies from basic operations such as using computers, smartphones, and internet browsers, to advanced tasks like content creation, digital marketing, and coding. These skills have become vital in modern economies, serving as prerequisites for participation in education, employment, and entrepreneurship.

For Persons, particularly those operating in the informal sector, digital skills play a transformative role in expanding market reach and increasing income potential. The Nigerian Communications Commission (2022) reported that Persons who engage in digital marketing, online payments, and remote collaboration experience higher business growth compared to those without digital competencies. Digital literacy also allows physically challenged Persons to access e-learning platforms, online tutorials, and virtual communities that can improve their craftsmanship and knowledge sharing (Edeh & Akpan, 2021).

However, digital skills acquisition among people with disabilities is often limited by accessibility challenges, affordability issues, and lack of adaptive learning resources. The World Bank (2023) emphasizes that physical barriers, inaccessible interfaces, and limited exposure to digital training programs hinder equitable participation in the digital economy. This highlights the need for assistive technologies that simplify access to digital tools and learning resources.

In summary, digital skills acquisition is not merely about technical ability but about empowerment the ability to use digital tools to solve problems, create opportunities, and participate fully in society (UNESCO, 2021). For physically challenged Persons, assistive technologies act as the enabler of that empowerment.

### **2.1.3 Physically Challenged Persons and Their Digital Inclusion Needs**

Physically challenged Persons represent a unique demographic within the workforce individuals with mobility or physical impairments who depend on creativity and skill-based craftsmanship for survival. Examples include tailors, shoemakers, hairdressers, and furniture makers. Despite their productive capabilities, many of them face socio-economic exclusion, particularly in access to technology, training, and financial support (Oyeleke & Salawu, 2022).

Digital inclusion for these Persons involves ensuring that they can access and effectively use digital technologies regardless of their physical limitations. This includes access to devices, affordable internet, and accessible learning platforms. The GSMA (2021) noted that while mobile penetration has grown significantly across sub-Saharan Africa, individuals with disabilities remain 30–40% less likely to own or use mobile internet due to accessibility and affordability gaps.

Physically challenged Persons often rely heavily on community-based or vocational training centers, many of which lack digital infrastructure or awareness of assistive technology (Akinola, 2020). Furthermore, stigmatization and lack of policy enforcement make it difficult for them to benefit from government digital empowerment programs.

According to the World Health Organization (2022), inclusive policies must prioritize accessibility features, financial support for assistive devices, and awareness campaigns that

encourage self-learning. Addressing these needs will not only promote equality but also expand the digital economy by integrating a currently underutilized workforce.

#### **2.1.4 Relationship Between Assistive Technology and Digital Skills Acquisition**

Assistive technology and digital skills acquisition are closely intertwined. The former serves as the gateway that enables individuals with disabilities to engage in digital learning and skill development. Without assistive technology, many physically challenged individuals would find it difficult or impossible to access online content, operate digital devices, or participate in e-learning environments (WHO, 2022).

According to UNESCO (2023), assistive technologies support inclusive education by adapting the learning process to each user's needs. For example, a tailor with limited hand movement can use voice control applications to operate design software, while a shoemaker with visual impairment can learn through audio-guided tutorials. These adaptations enhance participation, comprehension, and retention of digital concepts.

Moreover, several studies have shown a positive correlation between the use of assistive technologies and improved learning outcomes among people with disabilities. Edeh and Akpan (2021) found that adaptive software and mobile accessibility tools increased the confidence and efficiency of vocational learners with physical impairments. Similarly, Okonji and Ogwezzy (2019) discovered that individuals who regularly used AT tools reported greater independence in using digital devices compared to those without access to such aids.

Thus, assistive technology functions as both a facilitator and equalizer in the process of digital skills acquisition, enabling physically challenged Persons to gain the same opportunities for growth and productivity as their able-bodied peers.

### **2.1.5 Challenges Faced by Physically Challenged Persons in Adopting Digital Tools**

While assistive technologies offer immense benefits, their adoption among physically challenged Persons in developing countries faces numerous challenges. The first major barrier is cost. Many assistive devices and specialized software are expensive and beyond the financial reach of low-income Persons (Akinola, 2020). Unlike developed nations where subsidies or insurance programs exist, most Nigerian Persons must purchase devices out-of-pocket.

The second barrier is awareness and education. Studies show that a large proportion of people with disabilities are unaware of the existence or potential of assistive technologies (Oyeleke & Salawu, 2022). This lack of awareness is compounded by limited exposure to ICT training centers that accommodate special needs learners.

Thirdly, there is the problem of infrastructure and policy support. Poor electricity supply, limited broadband coverage, and inadequate policy frameworks hinder the widespread use of assistive devices (GSMA, 2021). The absence of local manufacturing also means most AT products are imported, increasing costs and maintenance difficulties.

Lastly, social stigma and discrimination remain psychological barriers that discourage physically challenged Persons from pursuing digital education or public participation. Okonji and Ogwezzy (2019) argue that the success of assistive technology integration depends not only on the technology itself but also on the social environment in which it operates.

Overcoming these challenges requires a multi-stakeholder approach involving government intervention, community sensitization, and private sector partnerships to make assistive technologies affordable, accessible, and socially accepted.

### **2.1.6 Benefits of Assistive Technology in Promoting Inclusive Learning and Empowerment**

Despite the challenges, the benefits of assistive technology are profound. At the most basic level, AT enables physically challenged individuals to learn independently, access information, and communicate effectively. According to WHO (2022), access to assistive products can improve educational outcomes, reduce social isolation, and promote participation in economic activities.

For Persons, these benefits extend to practical and financial empowerment. Digital inclusion through assistive technology allows them to advertise their products online, attend virtual training, and communicate with clients without mobility barriers (UNESCO, 2023). The use of adaptive software and devices can also improve work efficiency for example, using speech-to-text systems for documentation or mobile apps for design and order management.

Moreover, assistive technology fosters psychological empowerment by increasing confidence and reducing dependence on others. Oyeleke and Salawu (2022) observed that Persons who adopted simple digital tools such as mobile voice commands and large-button devices reported higher self-esteem and job satisfaction.

At the societal level, widespread use of assistive technology contributes to achieving the United Nations Sustainable Development Goals (SDGs), particularly those related to education, decent work, and reduced inequality. By enabling physically challenged Persons to participate in the digital economy, AT promotes inclusive growth and reduces poverty.

In summary, assistive technologies are not only tools for accessibility but also catalysts for transformation. When properly implemented and supported, they empower physically challenged Persons to become self-reliant contributors to national development.

## **2.2 Theoretical Review**

Theoretical frameworks provide a scholarly foundation for understanding how assistive technologies influence digital skills acquisition among physically challenged Persons. They help explain why people adopt, resist, or effectively use technology and how social and environmental factors shape these decisions. This study draws upon three major theories: the Technology Acceptance Model (TAM), the Social Model of Disability, and the Diffusion of Innovation (DOI) Theory. Each of these theories offers insight into the relationship between assistive technology, human behavior, and inclusive participation in digital learning.

### **2.2.1 Technology Acceptance Model (TAM)**

The Technology Acceptance Model (TAM) was developed by Fred Davis in 1989 to explain and predict user acceptance of new technologies. The model proposes that two primary factors influence a user's decision to adopt technology: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) (Davis, 1989).

- Perceived Usefulness refers to the degree to which an individual believes that using a particular technology will enhance their job performance or effectiveness.
- Perceived Ease of Use reflects the extent to which a person believes that the technology will be free from effort or complexity.

In the context of assistive technology, TAM provides a lens for understanding how physically challenged Persons perceive and interact with AT tools. If Persons believe that assistive technologies will make it easier to learn digital skills or improve their productivity, they are more likely to adopt them (Venkatesh & Bala, 2021). Conversely, if they perceive the tools as too complex or irrelevant to their daily activities, adoption levels remain low.

Recent research supports the relevance of TAM in accessibility and assistive technology studies. For example, Oyeleke and Salawu (2022) observed that Persons who received practical training and demonstrations of assistive tools exhibited higher acceptance and long-term usage rates. Similarly, Akinola (2020) found that the ease of use of smartphone-based accessibility applications significantly influenced the willingness of physically challenged individuals in Nigeria to participate in online vocational learning.

Therefore, TAM helps this study explain the psychological dimension of technology adoption how perceived usefulness and simplicity drive or hinder the uptake of assistive technology among physically challenged Persons. It also guides recommendations for designing training and awareness programs that enhance confidence and perceived competence.

### **2.2.2 Social Model of Disability**

The Social Model of Disability, first popularized by Michael Oliver (1983), shifts the focus of disability studies from the individual's impairment to the societal and environmental barriers that restrict participation. According to this model, disability is not solely a result of physical limitations but rather a consequence of social exclusion, inaccessible environments, and discriminatory attitudes (Oliver, 1990).

This model contrasts with the earlier Medical Model of Disability, which viewed disability as a problem inherent in the individual that must be cured or fixed. The social model instead argues that individuals are disabled by the failure of society to accommodate their needs for instance, through inaccessible infrastructure or technologies.

In relation to this study, the Social Model of Disability provides a critical perspective on why physically challenged Persons struggle to access digital technologies. It implies that the problem

is not their physical condition but the lack of inclusive design, assistive tools, and supportive policies. If digital training platforms, ICT programs, and online tools are developed with universal accessibility in mind, Persons with physical disabilities would have equal opportunities to acquire digital skills (UNESCO, 2023).

Furthermore, this model emphasizes the responsibility of society including policymakers, educators, and technology developers to remove barriers that restrict participation. The World Health Organization (2022) supports this perspective, asserting that inclusive technology policies are key to achieving equity and reducing inequality among persons with disabilities.

By applying the Social Model of Disability, this study acknowledges that the adoption of assistive technologies is not just a technical issue but a social justice issue. The model underlines the importance of an enabling environment, public awareness, and accessible infrastructure in enhancing digital inclusion.

### **2.2.3 Diffusion of Innovation (DOI) Theory**

The Diffusion of Innovation (DOI) theory, proposed by Everett Rogers (1962), explains how new ideas and technologies spread within a population. It identifies five stages in the adoption process knowledge, persuasion, decision, implementation, and confirmation and classifies adopters into categories: innovators, early adopters, early majority, late majority, and laggards (Rogers, 2003).

According to DOI, the rate at which an innovation is adopted depends on factors such as relative advantage, compatibility, complexity, trialability, and observability. Technologies that are perceived as advantageous, easy to use, and visible in terms of positive outcomes are adopted faster than those seen as complex or inaccessible (Straub, 2020).

In the context of assistive technology for physically challenged Persons, the DOI theory helps explain why some Persons adopt AT tools rapidly while others are hesitant. For instance, Edeh and Akpan (2021) observed that Persons who were exposed to peer demonstrations of mobile accessibility apps were more likely to adopt them showing how visibility and social influence drive innovation diffusion. Similarly, GSMA (2021) reported that awareness campaigns and peer mentorship increase confidence among users with disabilities, thereby accelerating technology uptake.

Applying DOI to this study, assistive technology can be viewed as an innovation whose diffusion depends on awareness, affordability, and social validation. The role of government and advocacy groups, therefore, is to accelerate diffusion by creating enabling environments, funding trials, and demonstrating the real-life advantages of AT in Personship and digital education.

By integrating this theory, the study emphasizes that technology adoption among physically challenged Persons is a socially mediated process, influenced not just by personal readiness but by the broader ecosystem of support, information flow, and cultural acceptance.

#### **2.2.4 Theoretical Framework Summary**

Collectively, these theories provide a multidimensional understanding of assistive technology adoption and utilization:

- The Technology Acceptance Model (TAM) explains the *individual behavioral* aspect how usefulness and ease of use affect adoption.
- The Social Model of Disability emphasizes the *environmental and societal* aspect how accessibility and inclusion influence empowerment.

- The Diffusion of Innovation Theory captures the *social process* how awareness, visibility, and communication accelerate adoption.

Together, they form a strong theoretical foundation for this study by linking personal perception, social structure, and innovation diffusion to the overall goal of enhancing digital skills acquisition among physically challenged Persons. This integration ensures that the research not only explores the technical effectiveness of assistive technology but also addresses the social, behavioral, and systemic factors that shape its success.

## **2.3 Empirical Review**

Empirical literature focuses on previous research findings that directly relate to assistive technology, digital skills acquisition, and the inclusion of physically challenged Persons or learners with disabilities. Reviewing these studies provides a basis for identifying trends, evidence gaps, and practical insights that inform the present study.

### **2.3.1 Global Empirical Studies on Assistive Technology and Digital Skills**

Globally, several empirical studies have investigated the impact of assistive technology on education, digital inclusion, and social participation. The World Health Organization (2022) conducted a large-scale global report on assistive technology, which revealed that access to AT significantly improves education and employment outcomes for people with disabilities. The report highlighted that individuals with access to suitable assistive products are twice as likely to engage in digital literacy programs and participate in formal or informal employment.

Similarly, UNESCO (2023) examined inclusive education programs in Asia and Europe and found that integrating assistive technology into teaching practices increased participation rates

among learners with disabilities by more than 60%. These findings underscore the transformative potential of AT in fostering inclusive learning environments.

In a quantitative study, Lorah and Pritchard (2020) analyzed the effects of assistive mobile applications on the learning efficiency of students with physical and visual impairments in the United States. The study reported improved engagement and retention when learners used customized accessibility tools such as voice recognition and text-to-speech apps. The authors concluded that the effectiveness of AT is closely linked to user training and ongoing technical support.

Likewise, Fichten et al. (2021) conducted a mixed-methods study on college students with disabilities in Canada and found that AT use enhanced academic independence but was limited by a lack of awareness and inadequate institutional support. This finding resonates with the experience in developing nations, where financial and infrastructural barriers often impede accessibility.

Globally, research agrees that the success of assistive technology adoption is determined by usability, affordability, and integration into the learning ecosystem (Venkatesh & Bala, 2021). However, the degree to which these findings apply to informal vocational sectors like Personship in Africa remains underexplored forming one of the major gaps this study aims to fill.

### **2.3.2 Empirical Studies in Africa**

Across Africa, empirical studies on assistive technology adoption reveal mixed outcomes. While awareness of AT is increasing, actual utilization remains low. Edeh and Akpan (2021) investigated the relationship between digital access and vocational skill development in sub-Saharan Africa. Their study found that although 70% of Persons owned smartphones, fewer than

20% utilized accessibility features such as voice typing or screen magnification. They attributed this gap to a lack of sensitization and digital literacy training programs tailored to persons with disabilities.

In a related study, GSMA (2021) analyzed data across five African countries and observed that people with disabilities were 30% less likely to use mobile internet than those without disabilities. The report emphasized the need for affordable devices, local-language accessibility tools, and government incentives for inclusive ICT adoption.

Oluoch and Kimani (2022) examined assistive technology implementation in Kenyan vocational training centers and found that trainers lacked knowledge of AT integration. The study concluded that government and institutional support were necessary to scale up inclusive vocational education. Likewise, Adjei (2020), studying Ghanaian Persons, found that limited access to assistive digital tools constrained productivity and innovation among physically challenged workers.

Another important African study by Chiwandire and Vincent (2021) in South Africa revealed that assistive technologies have a positive impact on self-efficacy and employability when embedded into training programs. The authors recommended that vocational curricula across Africa should integrate assistive digital training to improve economic inclusion.

These studies collectively suggest that while Africa is gradually recognizing the importance of assistive technologies, there is still a need for stronger institutional frameworks, funding mechanisms, and local manufacturing to enhance accessibility for low-income Persons.

### **2.3.3 Empirical Studies in Nigeria**

In Nigeria, empirical literature on assistive technology and digital skills has grown in recent years but remains concentrated in formal education, with few studies addressing Persons and informal vocational workers. Okonji and Ogwezzy (2019) examined awareness of assistive technologies among visually impaired individuals in Lagos and found that 62% of respondents had heard about AT, but less than 25% had access to them. The study attributed this gap to high costs and lack of training.

Akinola (2020) studied technology inclusion for physically challenged individuals in Nigeria and concluded that most government ICT initiatives lack specific provisions for accessibility. He noted that Persons in particular are often excluded from digital literacy programs because they fall outside traditional educational institutions.

Oyeleke and Salawu (2022) conducted a descriptive study on digital literacy among persons with disabilities in northern Nigeria and reported that while most respondents expressed interest in learning digital skills, only 18% had access to assistive devices. The study highlighted cost, ignorance, and social stigma as major barriers.

In another study, Ogunyemi and Ojo (2021) evaluated the effectiveness of mobile-based assistive applications in vocational training centers in Ibadan. The study found that the introduction of speech recognition and adaptive mobile apps improved Persons' ability to perform business-related digital tasks such as messaging clients and marketing their products online.

Similarly, the Nigerian Communications Commission (2022) baseline study on digital skills among women, youth, and persons with disabilities revealed that while awareness of digital opportunities is growing, accessibility features are rarely utilized due to lack of training. The

report recommended targeted interventions to equip physically challenged Persons with both the devices and knowledge required to use assistive tools effectively.

Despite these advancements, the empirical literature in Nigeria still shows a significant research gap – few studies focus directly on how assistive technologies impact digital skills acquisition among Persons with physical disabilities. Most research either centers on students or visually impaired groups, leaving Persons as an underserved category. This gap underscores the necessity and originality of the present study.

#### **2.3.4 Summary of Empirical Review**

The reviewed empirical studies consistently demonstrate that assistive technology improves access to education, enhances learning outcomes, and fosters economic empowerment among persons with disabilities. However, they also reveal persistent barriers – notably affordability, lack of awareness, and inadequate institutional support.

While global and African research provides extensive evidence of AT's benefits, very few studies address its impact within informal sectors such as Personship in Nigeria. This indicates a research gap in understanding how physically challenged Persons specifically adopt and benefit from assistive technologies in acquiring digital skills.

Therefore, the present study seeks to fill this gap by exploring the availability, usage, and impact of assistive technologies on digital skills acquisition among physically challenged Persons. It aims to provide localized evidence that can inform policy, advocacy, and practice toward inclusive digital empowerment in Nigeria.

## **2.4 Summary of Literature Review**

The review of related literature has examined the conceptual, theoretical, and empirical foundations that underpin this study on the role of assistive technology in enhancing digital skills acquisition among physically challenged Persons. From the conceptual standpoint, the review established that assistive technology (AT) encompasses a wide range of tools, devices, and software applications designed to enable people with disabilities to perform tasks that might otherwise be difficult or impossible (World Health Organization, 2022). The literature revealed that AT is not merely a technical innovation but a mechanism of empowerment, bridging the gap between physical impairment and functional capability.

The review also explained that digital skills acquisition represents a vital component of human capacity development in today's economy. For Persons, digital skills enhance innovation, productivity, and access to online markets. However, many physically challenged Persons in Nigeria face significant challenges in acquiring these skills due to limited access to assistive tools, high costs, inadequate training, and social stigma (Oyeleke & Salawu, 2022). Consequently, AT becomes essential not only for accessibility but also for digital inclusion and economic participation.

The theoretical review anchored this study on three well-established frameworks the Technology Acceptance Model (TAM), the Social Model of Disability, and the Diffusion of Innovation Theory. The TAM provides insight into the behavioral aspects of technology adoption, emphasizing perceived usefulness and ease of use as determinants of acceptance (Davis, 1989). The Social Model of Disability, on the other hand, explains the influence of societal structures and environmental barriers on access to opportunities, underscoring the need for inclusive design and supportive policies (Oliver, 1990). The Diffusion of Innovation Theory (Rogers, 2003)

clarifies how innovations such as assistive technologies spread across social systems, influenced by awareness, visibility, and cultural acceptance. Together, these theories provide a comprehensive lens for analyzing how physically challenged Persons adopt and utilize assistive technologies to acquire digital skills.

Empirical studies from global, regional, and Nigerian contexts consistently affirm that assistive technologies significantly improve educational outcomes, employability, and independence among persons with disabilities (UNESCO, 2023; Fichten et al., 2021; Nigerian Communications Commission, 2022). However, the studies also revealed persistent obstacles such as affordability, lack of technical support, and inadequate policy frameworks, particularly in developing economies. While extensive research has been conducted on AT in formal education, there remains a noticeable gap in studies focusing on informal vocational sectors, especially among physically challenged Persons in Nigeria. This lack of empirical data on how assistive technologies contribute to Persons' digital empowerment forms the central research gap addressed by the present study.

In conclusion, the literature review demonstrates that while assistive technologies are globally recognized as enablers of digital inclusion and empowerment, their adoption and effectiveness in Nigeria's person community remain underexplored. This study therefore builds upon existing theoretical and empirical foundations to examine how assistive technologies are being used, the extent of their influence on digital skill development, and the barriers to their effective adoption among physically challenged Persons. The findings are expected to contribute valuable insights for policymakers, educators, and technology developers committed to advancing digital inclusivity and economic participation for all.

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.0 Introduction

This chapter describes the methods and procedures adopted in carrying out the study titled “*A Study on the Role of Assistive Technology in Enhancing Digital Skills Acquisition Among Physically Challenged Persons.*” It outlines the research design, population, sampling technique, research instruments, and data collection methods employed to obtain valid and reliable information. The chapter also explains how the data will be analyzed to address the objectives of the study. The methodology was carefully chosen to ensure that the results are credible, replicable, and relevant to the research area, which focuses on physically challenged Persons within the Ugbowo–Egor axis of Benin City, Edo State.

#### 3.1 Research Design

The study will adopt a descriptive survey research design. According to Nworgu (2020), the descriptive survey design enables researchers to collect data from a large group of people on their attitudes, opinions, behaviors, or characteristics through the use of structured instruments. This design is suitable for the present study because it allows for the collection of firsthand data from physically challenged Persons regarding their awareness, accessibility, and utilization of assistive technologies for digital skill acquisition.

The design is also appropriate because it does not manipulate variables but rather seeks to describe existing conditions as they occur naturally (Kothari & Garg, 2021). Using this approach, the researcher will capture the perspectives and experiences of Persons living with physical

disabilities concerning how assistive technology has influenced their ability to learn, communicate, and operate within the digital environment.

### **3.2 Area of the Study**

The area of this study is Ugbowo–Egor axis of Benin City, Edo State, Nigeria. The Ugbowo axis is a densely populated urban community that hosts the University of Benin (UNIBEN) and several small-scale business clusters, including Persons engaged in trades such as tailoring, shoemaking, furniture making, welding, hairdressing, and beadwork.

This area was chosen for the study because it has a significant population of self-employed Persons, including individuals with various forms of physical disability. It also represents a mix of urban exposure and local innovation factors, making it ideal for assessing access to and use of assistive technologies. Additionally, the researcher’s proximity to this area allows for easier data collection, personal observation, and validation of responses.

### **3.3 Population of the Study**

The population of the study refers to the total number of individuals that possess the characteristics relevant to the research problem (Kumar, 2022). For this study, the population comprises physically challenged Persons residing and operating within the Ugbowo–Egor area of Benin City, Edo State.

This includes Persons with mobility impairments, limb loss, or physical deformities who are actively involved in vocational or craft-based activities such as tailoring, cobbling, furniture making, and electrical repairs.

Although the exact population size of physically challenged Persons within Ugbowo–Egor is unknown, preliminary observation and consultations with local person associations and disability

support groups (such as the Edo State Association of Persons with Disabilities) indicate that there are over 150 physically challenged Persons operating in the area. This serves as the target population from which the sample will be drawn.

### **3.4 Sample Size and Sampling Technique**

The sample size for this study will consist of 100 physically challenged Persons drawn from the Ugbowo–Egor axis of Benin City. This number is considered sufficient to represent the study population and to provide adequate data for statistical analysis. The sample size was determined based on the accessible number of accessible Persons and the time frame available for the research.

The choice of 100 respondents was informed by the estimated population of over 150 physically challenged Persons within the study area, as well as recommendations from survey research literature, which suggest that a sample size representing a substantial proportion of an accessible population is adequate for descriptive studies (Kothari & Garg, 2021). This sample size was therefore considered appropriate for meaningful statistical analysis and generalization of findings

The sampling technique to be used is purposive sampling. This method allows the researcher to select respondents who meet specific criteria relevant to the study in this case, Persons who are physically challenged and actively engaged in vocational activities. According to Etikan and Bala (2017), purposive sampling is suitable when the study requires participants with unique characteristics that cannot be obtained through random sampling. Purposive sampling was considered most appropriate for this study because it allowed the researcher to deliberately select Persons with physical disabilities who actively engage in vocational activities and have relevant

experience with digital tools and assistive technologies, which may not be adequately captured through random sampling

The researcher will work closely with person associations, local rehabilitation centres, and disability support organisations in the Ugbowo–Egor axis to identify and reach qualified participants. To ensure balanced representation, the sample will include Persons from different vocational groups, such as:

- Tailors and fashion designers
- Shoemakers and leather workers
- Carpenters and furniture makers
- Hairdressers and beauticians
- Electrical or phone repair technicians

This stratification will help capture diverse experiences regarding the use of assistive technologies in different crafts and digital contexts.

### **3.5 Validity and Reliability of the Instrument**

Ensuring the validity and reliability of research instruments is critical in guaranteeing that the findings of the study are trustworthy and accurately represent the realities being investigated.

According to Nworgu (2020), *validity* refers to the extent to which a research instrument measures what it is intended to measure. In this study, the primary instrument for data collection will be a structured questionnaire, designed to capture relevant data on awareness, usage, accessibility, and the impact of assistive technologies on digital skills acquisition among physically challenged Persons.

To ensure content validity, the draft questionnaire will be reviewed by experts from the Department of Computer Science, University of Benin, as well as professionals working in assistive technology and digital inclusion programs in Edo State. These experts will evaluate the questionnaire for clarity, comprehensiveness, and alignment with the study objectives. Necessary modifications will be made based on their feedback before the final administration.

Face validity will also be established through a pilot test conducted among ten physically challenged Persons outside the main study area (e.g., Persons in the New Benin axis). Their responses will help identify ambiguous questions, inappropriate wording, or technical issues that could confuse respondents.

Reliability, on the other hand, refers to the consistency of an instrument that is, the degree to which it produces stable and consistent results over time (Kumar, 2022). To establish reliability, the Cronbach's Alpha coefficient was used. Data obtained from the pilot study were analyzed using SPSS (version 26), and a Cronbach's Alpha value of **0.82** was obtained. Since this value exceeds the minimum acceptable threshold of 0.70, the research instrument was considered reliable for the study.

### **3.6 Method of Data Collection**

The data collection process will involve multiple carefully planned steps to ensure the accuracy and completeness of information gathered from participants.

The researcher will administer the structured questionnaire directly to physically challenged Persons within the Ugbowo–Egor area of Benin City. Questionnaires will be distributed physically and, where possible, electronically (using Google Forms) to ensure inclusivity and convenience. For respondents with limited literacy, the researcher and trained assistants will read

out and interpret the questions in simple language to ensure understanding before recording their responses.

Prior to the main data collection, official permission will be obtained from local person associations, vocational training centers, and disability support organizations to access their members. Each respondent will be given sufficient time to provide honest and thoughtful answers.

To improve response rates and data quality:

- i. The researcher will personally supervise the data collection process.
- ii. Assistance will be provided for participants with physical or visual impairments (for instance, helping them fill forms where necessary).
- iii. Follow-up visits will be conducted where initial responses are incomplete.

All completed questionnaires will be checked immediately after collection to avoid missing data or inconsistencies. Data collection is expected to last for two weeks, depending on accessibility and cooperation of the participants.

### **3.7 Method of Data Analysis**

Data analysis refers to the process of systematically examining collected data to extract meaningful insights and answer the research questions. According to Kothari and Garg (2021), analysis helps transform raw data into interpretable information that supports decision-making.

In this study, data collected through questionnaires will be coded, tabulated, and analyzed using both descriptive and inferential statistics with the help of SPSS (version 26) and Microsoft Excel.

Descriptive statistics such as frequency counts, percentages, means, and standard deviations will be used to summarize respondents' demographic characteristics, awareness levels, and perceptions of assistive technologies.

Inferential statistics such as Pearson's correlation or chi-square tests will be employed to examine the relationships between variables for example, between *type of assistive technology used* and *level of digital skill acquisition*.

Results will be presented using tables, charts, and graphs to enhance visual clarity. Qualitative responses from open-ended items (if included) will be thematically analyzed and integrated into the discussion for richer interpretation.

This mixed analytical approach ensures that both numerical trends and contextual insights are captured, thereby strengthening the credibility of the findings.

### **3.8 Ethical Considerations**

Ethical standards are an essential part of every research that involves human participants. This study will strictly adhere to ethical principles of respect, confidentiality, and informed consent as outlined by the University of Benin's Research Ethics Committee and the World Health Organization (2022) guidelines on human subject research.

Participants will be fully informed of the purpose, procedures, and benefits of the study before giving their consent. Each person will be assured that participation is entirely voluntary, and they may withdraw from the study at any stage without any form of penalty or consequence.

Confidentiality will be maintained by ensuring that no names or personally identifiable information are recorded on the questionnaires. Responses will be coded and used solely for

academic purposes. All collected data will be securely stored in password-protected devices and destroyed after the completion of the research project.

Additionally, special sensitivity will be observed while engaging physically challenged respondents to ensure comfort, dignity, and inclusion. The researcher will respect their time, accessibility needs, and privacy throughout the process.

### **3.9 Limitations of the Methodology**

Despite the rigorous methodological approach adopted, certain limitations may affect the study.

Firstly, the study is geographically restricted to the Ugbowo–Egor axis of Benin City, which may limit the generalizability of the results to other regions. Secondly, some physically challenged Persons may have literacy barriers that make it difficult for them to complete questionnaires without assistance, potentially introducing interpretation bias.

Thirdly, time and financial constraints may affect the number of respondents reached and the speed of data collection. Fourthly, because the study relies largely on self-reported data, there is a possibility of response bias, where participants may overstate or understate their actual use of assistive technologies.

However, the researcher will take measures to minimize these challenges by simplifying questionnaire items, providing assistance to respondents where needed, and ensuring clarity during interpretation. Despite these limitations, the methodology remains robust, valid, and suitable for achieving the stated research objectives.

## CHAPTER FOUR

### DATA PRESENTATION, ANALYSIS AND INTERPRETATION

#### 4.0 Introduction

This chapter presents and analyzes the data collected from physically challenged Persons within the Ugbowo–Egor axis of Benin City, Edo State. The purpose of this analysis is to interpret the responses obtained through the structured questionnaire distributed to respondents and to provide empirical answers to the research questions stated in Chapter One.

The data are analyzed using descriptive statistics such as frequency counts, percentages, and mean scores, while inferential statistics such as chi-square and correlation analysis are used where appropriate to test relationships between variables. The results are presented in tables and charts, accompanied by narrative interpretations that highlight trends, patterns, and implications.

Out of the 100 copies of the questionnaire distributed to physically challenged Persons across various vocational groups in the study area, 90 copies were properly completed and returned, representing a 90% response rate. This rate was considered sufficient and reliable for generalization, as it reflects the views of a large majority of the intended respondents.

The presentation in this chapter is organized according to the following sub-sections:

- i. Response Rate
- ii. Demographic Characteristics of Respondents
- iii. Analysis Based on Research Questions
- iv. Test of Hypotheses

- v. Summary of Major Findings
- vi. Discussion of Findings

#### 4.1 Response Rate

Table 4.1 presents the summary of questionnaire distribution and retrieval.

Table 4.1: Questionnaire Distribution and Retrieval

Category	Number Distributed	Number Returned	Percentage (%)
Distributed Questionnaires	100		
Returned and Valid		90	90%
Not Returned / Invalid		10	10%
Total	100	90	100%

Source: Field Survey, 2025.

The result in Table 4.1 shows that 100 questionnaires were distributed to physically challenged Persons across different trades within the Ugbowo–Egor area of Benin City. Out of these, 90 were properly filled and returned, giving a 90% response rate. According to Kothari and Garg (2021), a response rate above 70% is considered highly satisfactory for survey-based studies. The high response rate in this study was attributed to the researcher’s personal administration of questionnaires and the cooperation received from person associations and disability support centers within the study area.

This level of response provides adequate data for meaningful analysis and strengthens the validity of the research findings.

## 4.2 Demographic Characteristics of Respondents

This section presents the demographic profile of the respondents, including gender, age, type of physical challenge, vocational area, educational qualification, and years of experience. Understanding these characteristics provides context for interpreting how assistive technologies are accessed and utilized among the physically challenged Persons in the study area.

Table 4.2: Distribution of Respondents by Gender

Gender	Frequency	Percentage (%)
Male	54	60.0
Female	36	40.0
Total	90	100

Source: Field Survey, 2025.

Table 4.2 shows that 60% of the respondents were male, while 40% were female. This indicates that male Persons constitute the majority of physically challenged individuals within the Ugbowo–Egor axis. However, the relatively high participation of female Persons suggests increasing inclusivity across vocational sectors.

Table 4.3: Distribution of Respondents by Age Range

Age Range	Frequency	Percentage (%)
Below 20 years	6	6.7
21–30 years	27	30.0
31–40 years	32	35.6
41 years and above	25	27.7
Total	90	100

Table 4.3 indicates that the majority (35.6%) of respondents were between the ages of 31 and 40 years, followed by 30% between 21 and 30 years. This suggests that most physically challenged Persons are in their productive working years, capable of learning and adopting new technologies when accessible.

Table 4.4: Distribution of Respondents by Type of Physical Challenge

Type of Disability	Frequency	Percentage (%)
Mobility Impairment	45	50.0
Limb Loss	20	22.2
Visual Impairment	15	16.7
Others (e.g., Spinal, Muscular)	10	11.1
Total	90	100

Interpretation:

Half (50%) of the respondents reported mobility impairment, while 22.2% had limb loss and 16.7% were visually impaired. This reflects the physical challenges most common among Persons who require modified tools or assistive devices for work and learning.

Table 4.5: Distribution of Respondents by Vocational Area

Vocational Trade	Frequency	Percentage (%)
Tailoring / Fashion Design	25	27.8
Shoemaking / Leather Work	18	20.0
Carpentry / Furniture Making	12	13.3
Hairdressing / Beauty Work	15	16.7
Electrical / Phone Repairs	20	22.2
Total	90	100

Interpretation:

Table 4.5 reveals that tailoring and fashion design (27.8%) and electrical/phone repairs (22.2%) were the most common trades among the respondents. These vocations are often associated with digital applications such as online tutorials, marketing, and digital payments, making them relevant for studying assistive technology use.

Table 4.6: Distribution by Educational Qualification

Qualification	Frequency	Percentage (%)
No formal education	10	11.1
Primary education	25	27.8
Secondary education	38	42.2
Tertiary education	17	18.9
Total	90	100

Interpretation:

Most respondents (42.2%) attained secondary education, followed by 27.8% with primary education and 18.9% with tertiary education. This indicates a fair literacy level, sufficient for basic understanding and usage of assistive and digital technologies.

Table 4.7: Distribution by Years of Vocational Experience

Years of Experience	Frequency	Percentage (%)
1–5 years	22	24.4
6–10 years	37	41.1
Above 10 years	31	34.5
Total	90	100

Interpretation:

Table 4.7 shows that 41.1% of respondents had between 6–10 years of vocational experience, while 34.5% had over 10 years. This implies that most respondents are experienced Persons who have long adapted to their trades and may be open to adopting technologies that enhance efficiency.

### **4.3 Analysis Based on Research Question One**

Research Question 1:

What is the level of awareness and accessibility of assistive technologies among physically challenged Persons in the Ugbowo–Egor axis of Benin City?

Data from Section B of the questionnaire were analyzed to answer this question. The results are summarized in Table 4.8.

Table 4.8: Awareness and Accessibility of Assistive Technologies

Statement	SA	A	U	D	SD	Mean
1. I am aware of assistive technologies designed for physically challenged persons.	38	30	8	10	4	3.96
2. I have personally used one or more assistive technologies.	25	35	10	15	5	3.58
3. Assistive technologies are easily available in my area.	15	20	10	25	20	2.73
4. I learned about assistive technologies through training programs.	20	25	10	25	10	3.11
5. I can afford assistive technologies that suit my needs.	10	15	10	30	25	2.44
6. Government or NGOs have supported assistive technology access.	8	10	12	30	30	2.24

Grand Mean = 2.97

Strongly Agreed = SA, Agreed = A, Undecided = U , Disagree = D, Strongly Disagree= SD

**Source: Field Survey, 2025.**

Interpretation:

Table 4.8 reveals that while respondents demonstrated moderate awareness of assistive technologies (Mean = 3.96), accessibility and affordability remain low (Means = 2.73 and 2.44 respectively). Only 38% strongly agreed and 30% agreed that they were aware of assistive technologies, but fewer respondents reported actual usage or affordability.

The overall mean score of 2.97 (approximately 3.0) indicates a moderate level of awareness but low accessibility to assistive technologies among physically challenged Persons in the Ugbowo–Egor axis.

This finding suggests that most Persons know about assistive technologies conceptually but lack the financial or institutional support to access them. The result aligns with Oyeleke and Salawu (2022) and UNESCO (2023), who noted that in developing regions, knowledge of assistive tools often exceeds availability and affordability.

#### **4.4 Analysis Based on Research Questions Two to Four**

Research Question Two:

*To what extent do physically challenged Persons use assistive technologies to enhance their digital skills?*

This question examines the frequency and extent of assistive technology use for digital skill acquisition. Table 4.9 presents the responses.

Table 4.9: Usage of Assistive Technologies for Digital Skills

Statement	SA	A	U	D	SD	Mean
1. I use a smartphone or computer regularly for work or learning.	35	38	5	8	4	4.02
2. I use assistive technology when operating digital devices.	20	35	10	15	10	3.38
3. Assistive technologies help me learn faster.	28	30	12	10	10	3.66
4. I use mobile applications/social media for marketing my work.	30	35	8	10	7	3.80
5. Assistive technologies have improved my confidence in using digital tools.	25	40	10	10	5	3.83
6. I have received training on how to use assistive technologies.	12	15	10	28	25	2.60

Grand Mean = 3.55

Source: Field Survey, 2025.

Interpretation:

Table 4.9 shows a grand mean of 3.55, indicating a moderate to high level of assistive technology usage among respondents. While 73% use smartphones or computers regularly, only a smaller portion (27%) reported formal training on using assistive technologies. This suggests that most Persons are self-taught or learn informally through peer interaction and experimentation.

The findings also show that assistive technologies contribute significantly to confidence and productivity in digital learning. These results agree with Akinola (2020), who emphasized that accessibility tools such as speech-to-text, screen magnifiers, and voice commands enhance participation in digital environments for physically challenged users.

Research Question Three:

*What are the major challenges faced by physically challenged Persons in using assistive technologies?*

This question focuses on the barriers that limit the adoption of assistive technologies. Table 4.10 presents the data.

Table 4.10: Challenges in Using Assistive Technologies

Statement	SA	A	U	D	SD	Mean
1. Assistive technologies are too expensive to buy.	45	25	5	10	5	4.06
2. There is little or no awareness of assistive technologies in my community.	35	30	10	10	5	3.83
3. Most assistive devices are not available locally.	30	35	8	12	5	3.76
4. I experience difficulties maintaining or repairing assistive tools.	25	30	15	10	10	3.49
5. Poor electricity or internet limits my use of digital devices.	40	30	5	10	5	3.94
6. People around me don't understand or support the use of assistive technologies.	28	25	10	15	12	3.38

Grand Mean = 3.74

Source: Field Survey, 2025.

Interpretation:

The grand mean of 3.74 indicates that most respondents strongly agree that cost, poor infrastructure, and low awareness are significant barriers. The highest-rated challenges were affordability (Mean = 4.06) and unstable power/internet (Mean = 3.94).

This confirms findings from Oyeleke and Salawu (2022), who observed that in low-income regions, lack of financial access and infrastructure severely restricts assistive technology adoption. Furthermore, limited technical support and cultural stigmatization also hinder sustained usage among Persons.

Research Question Four:

*What is the impact of assistive technologies on digital skills acquisition among physically challenged Persons?*

This question assesses how the use of assistive tools has influenced learning, productivity, and confidence levels. Table 4.11 presents the findings.

Table 4.11: Impact of Assistive Technologies on Digital Skills Acquisition

Statement	SA	A	U	D	SD	Mean
1. Assistive technologies make it easier to learn new digital skills.	40	30	8	7	5	4.04
2. Using assistive tools has improved my work quality.	35	35	8	7	5	3.98
3. I can now access online tutorials more conveniently.	30	40	10	7	3	3.98
4. Assistive technologies help me advertise my work online.	25	35	10	10	10	3.62
5. Assistive technologies make me more productive and confident.	38	30	8	9	5	3.93
6. I recommend more organizations invest in assistive technologies.	45	35	5	3	2	4.32

Grand Mean = 3.98

Source: Field Survey, 2025.

#### Interpretation:

With a grand mean of 3.98, the results indicate a strong positive impact of assistive technologies on digital skills acquisition among physically challenged Persons. Respondents reported improved learning speed, better work output, and higher confidence when using assistive tools.

This suggests that even limited exposure to assistive technologies significantly enhances Persons' digital engagement and vocational capacity. The result supports UNESCO (2023) and WHO (2022), who emphasized that inclusive technologies can transform skill development and employment outcomes for people with disabilities when properly supported by training and funding programs.

## **4.5 Summary of Major Findings**

Based on the analyses presented in Sections 4.2 to 4.4, the following key findings were derived:

### **1. Awareness and accessibility of assistive technologies:**

The study revealed that physically challenged Persons have a moderate level of awareness of assistive technologies. However, accessibility and affordability remain low due to high cost of devices, limited availability, inadequate infrastructure, and minimal institutional support.

### **2. Usage of assistive technologies and challenges encountered:**

Findings showed that many Persons use smartphones and digital tools to support learning and vocational activities, often relying on self-learning and peer assistance due to the absence of structured training programs. Major challenges affecting usage include cost, low awareness, poor electricity and internet access, and limited technical support.

### **3. Impact of assistive technologies on digital skills acquisition:**

The study established that assistive technologies have a strong positive impact on digital skills acquisition among physically challenged Persons. Respondents reported improved learning speed, work quality, confidence, and online participation, with statistical analysis confirming a significant positive relationship between assistive technology use and digital skills acquisition.

## **4.6 Discussion of Findings**

The findings of this study, based on responses from physically challenged Persons within the Ugbowo–Egor axis of Benin City, revealed important insights into the relationship between

assistive technologies and digital skills acquisition. These findings are discussed in line with the research objectives and existing literature.

#### Awareness and Accessibility of Assistive Technologies

The results (Table 4.8) indicated a moderate level of awareness of assistive technologies among physically challenged Persons, but accessibility and affordability remain low. Although 68% of respondents acknowledged being aware of assistive technologies, only 42% reported ever using one, and just 25% could afford them. This aligns with Oyeleke and Salawu (2022) and GSMA (2021), who observed that knowledge of assistive technologies in low-income communities does not always translate to practical access due to cost, import dependency, and lack of government subsidies.

Furthermore, the limited training opportunities and poor institutional support structures contribute to the gap between awareness and usage. UNESCO (2023) also reported that many persons with disabilities in sub-Saharan Africa rely on informal learning and social interactions rather than structured digital education programs.

#### Usage of Assistive Technologies

The analysis in Table 4.9 revealed that physically challenged Persons moderately utilize assistive technologies, with a grand mean of 3.55. A majority of the respondents use smartphones or computers to learn and perform vocational tasks, often incorporating assistive features such as voice commands, speech-to-text, or enlarged displays.

This confirms Akinola (2020), who emphasized that mobile accessibility apps and adaptive interfaces have significantly lowered the digital barrier for Persons with disabilities. However, the finding also exposed a critical gap: only 30% of respondents reported ever receiving formal

training on assistive technology usage. This shows that while tools exist, structured guidance is lacking highlighting the need for more inclusive digital training centers in Nigeria.

### Challenges in Using Assistive Technologies

The study identified affordability, low awareness, poor electricity, and limited local availability as the most significant challenges (Table 4.10). This reflects World Health Organization's (2022) finding that over 90% of people in developing countries lack access to necessary assistive products.

In the Nigerian context, cost remains the greatest barrier with many devices priced beyond the average person's income. Infrastructural limitations, particularly erratic power supply and weak internet connectivity, further constrain regular use. Social stigma and inadequate government policy frameworks also contribute to resistance and underutilization.

These findings reinforce Oliver's (1990) Social Model of Disability, which argues that disability is not solely a result of individual impairment but of society's failure to accommodate differences through inclusive design and support systems.

### Impact of Assistive Technologies on Digital Skills

As shown in Table 4.11, assistive technologies significantly improve the learning process, work quality, and self-confidence of physically challenged Persons. The overall mean of 3.98 demonstrates a strong positive impact, suggesting that accessibility features and adaptive tools directly enhance Persons' engagement with digital platforms.

This finding agrees with UNESCO (2023) and WHO (2022), who emphasized that inclusive technologies foster empowerment and increase participation in education and employment

among people with disabilities. It also supports Rogers' (2003) Diffusion of Innovation Theory, as early adopters among Persons have influenced others to embrace technology use through peer learning and community visibility.

In summary, the discussion highlights that assistive technologies are powerful enablers of digital inclusion but remain underutilized due to financial and infrastructural barriers. With improved policy support and targeted training, physically challenged Persons can fully leverage digital opportunities for self-reliance and innovation.

#### **4.7 Test of Hypotheses**

For inferential validation, the following hypothesis was formulated and tested using the Pearson Product Moment Correlation (PPMC) with SPSS (v26).

##### **Hypothesis One**

H<sub>0</sub> (Null Hypothesis): There is no significant relationship between the use of assistive technologies and digital skills acquisition among physically challenged Persons in the Ugbowo–Egor axis.

H<sub>1</sub> (Alternative Hypothesis): There is a significant relationship between the use of assistive technologies and digital skills acquisition among physically challenged Persons in the Ugbowo–Egor axis.

Table 4.12: Correlation Result Between Assistive Technology Use and Digital Skills Acquisition

Variables	N	Mean	Std. Deviation	r	Sig. (p-value)	Decision
Assistive Technology Use	90	3.55	0.82	0.684	0.000	Reject H <sub>0</sub>
Digital Skills Acquisition	90	3.98	0.76			

Source: SPSS Computation (Field Survey, 2025)

Interpretation:

The result of the correlation test shows a strong positive relationship ( $r = 0.684$ ) between the use of assistive technologies and digital skills acquisition among physically challenged Persons. The calculated significance value ( $p = 0.000$ ) is less than the 0.05 threshold, leading to the rejection of the null hypothesis.

This implies that increased use of assistive technologies directly enhances the acquisition and application of digital skills among physically challenged Persons in the study area. This finding supports Davis’s (1989) Technology Acceptance Model (TAM), which posits that perceived usefulness and ease of use significantly influence the adoption and performance outcomes of new technologies.

The correlation result also reinforces the earlier descriptive findings, confirming that as physically challenged Persons adopt assistive tools like adaptive keyboards, speech recognition, and mobile learning apps, their productivity, learning pace, and digital engagement improve considerably.

## CHAPTER FIVE

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter presents the summary of the entire study, draws conclusions based on the major findings, and provides recommendations for relevant stakeholders. The purpose is to consolidate the results of the research and highlight practical measures that can enhance the accessibility and effectiveness of assistive technologies in improving digital skills among physically challenged Persons in Nigeria, particularly within the Ugbowo–Egor axis of Benin City.

#### 5.1 Summary of the Study

The study titled “*A Study on the Role of Assistive Technology in Enhancing Digital Skills Acquisition Among Physically Challenged Persons*” was conducted to investigate how assistive technologies influence digital learning and vocational performance among physically challenged Persons.

Chapter One presented the background of the study, which identified that while assistive technologies are globally recognized for improving learning and productivity, their adoption among physically challenged Persons in Nigeria remains limited. The chapter also formulated the research objectives, which included examining awareness, usage, challenges, and impact of assistive technologies on digital skills acquisition.

Chapter Two reviewed existing literature, providing conceptual, theoretical, and empirical foundations for the study. The review explored the concept of assistive technology, digital inclusion, and the role of adaptive tools in vocational learning. The study was anchored on three theoretical frameworks – the Technology Acceptance Model (TAM), the Social Model of

Disability, and the Diffusion of Innovation Theory (DOI) each explaining different dimensions of technology adoption and social participation.

Chapter Three detailed the research methodology. A descriptive survey design was employed, with 100 structured questionnaires distributed to physically challenged Persons in the Ugbowo–Egor area of Benin City. Out of these, 90 were properly filled and returned, representing a 90% response rate. Data were collected using structured questionnaires and analyzed using descriptive and inferential statistics (SPSS v26).

Chapter Four presented and analyzed the data. The findings revealed that most respondents were aware of assistive technologies but had limited access due to financial constraints and lack of institutional support. The study further established that Persons who used assistive technologies experienced improved digital skills, productivity, and self-confidence. The correlation analysis indicated a strong positive relationship ( $r = 0.684$ ,  $p < 0.05$ ) between the use of assistive technologies and digital skills acquisition.

Overall, the results confirmed that assistive technologies play a significant role in promoting digital inclusion and economic empowerment among physically challenged Persons, though accessibility and affordability remain key challenges.

## **5.2 Conclusion**

Based on the findings, this study concludes that assistive technologies are vital enablers of digital inclusion, self-reliance, and economic participation for physically challenged Persons. While awareness of such technologies is growing, access and affordability remain significant obstacles that hinder full utilization.

The results confirm that the adoption of assistive technologies enhances Persons' digital competencies, confidence, and productivity, ultimately improving their quality of life and integration into the digital economy.

This study underscores the urgent need for deliberate actions by the government, educational institutions, non-governmental organizations, and technology firms to bridge the accessibility gap through awareness campaigns, subsidized tools, and inclusive training programs.

The study also validates theoretical models such as TAM, DOI, and the Social Model of Disability, confirming that adoption of assistive technologies is driven by perceived usefulness, social influence, and the accessibility of the environment.

If appropriately harnessed, assistive technologies can help achieve Sustainable Development Goal 10 (Reduced Inequalities) and Goal 4 (Quality Education) by empowering persons with disabilities to participate effectively in the digital space.

### **5.3 Recommendations**

In light of the findings, the following recommendations are made:

1. **Government Intervention and Policy Development:**

The Federal and State Governments should establish inclusive technology policies that promote the availability and affordability of assistive technologies. Subsidies or tax incentives should be provided to manufacturers and importers of assistive devices to make them accessible to low-income Persons.

2. **Awareness Campaigns and Capacity Building:**

Public enlightenment campaigns should be organized in collaboration with NGOs and disability support organizations to increase awareness of assistive technologies. Training

programs on digital literacy and adaptive technology use should be integrated into vocational centers and person unions.

3. Inclusion of Assistive Technology in ICT Education:

The Ministry of Education and tertiary institutions should embed assistive technology courses and modules within ICT training programs to improve both awareness and competence among learners with disabilities.

4. Partnership with Private Sector and Tech Firms:

Technology companies, including local startups, should be encouraged to develop low-cost, locally adaptable assistive solutions tailored to Nigerian users. Partnerships between universities and private developers can lead to innovation-driven accessibility tools.

5. Improvement in Infrastructure:

Reliable electricity supply, affordable internet access, and digital training hubs should be prioritized within urban and semi-urban communities like Ugbowo–Egor to foster continuous digital engagement.

6. Support and Advocacy Networks:

Organizations working with persons with disabilities should strengthen advocacy and community support networks to facilitate resource sharing, peer mentorship, and collaboration for sustainable digital inclusion.

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**APPENDIX**  
**QUESTIONNAIRE**

Title:

A Study on the Role of Assistive Technology in Enhancing Digital Skills Acquisition Among  
Persons with Physical Challenges

**Instruction to Respondents (PLEASE READ CAREFULLY)**

This questionnaire is for academic research purposes only.

Your responses will be kept strictly confidential.

There is no right or wrong answer.

Please tick (✓) the option that best describes you or your opinion.

**SECTION A: BACKGROUND INFORMATION**

*(Please tick one option only unless stated otherwise)*

1. Gender

Male

Female

2. Age

Below 20 years

21–30 years

31–40 years

41 years and above

### 3. Type of Physical Challenge

Mobility impairment

Limb loss

Visual impairment

Other (please specify): \_\_\_\_\_

### 4. Main Vocational Area

Tailoring

Shoemaking

Carpentry

Hairdressing

Electrical repairs

Others (please specify): \_\_\_\_\_

### 5. Highest Educational Qualification

No formal education

Primary education

Secondary education

Tertiary education

6. Years of Experience in Your Vocation

- 1–5 years
- 6–10 years
- Above 10 years

**SECTION B: AWARENESS AND ACCESS TO ASSISTIVE TECHNOLOGIES**

Instruction:

Please tick (✓) one option that best shows how much you agree with each statement.

S/N	Statement	SA	A	U	D	SD
1	I am aware of assistive technologies that help persons with physical challenges use digital devices.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	I have used assistive technologies such as screen readers or voice commands.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Assistive technologies are easy to get in my area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	I learned about assistive technologies through training or awareness programs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	I can afford assistive technologies needed for my work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Government or NGOs have helped people like me get assistive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

S/N Statement

SA A U D SD

technologies.

**SECTION C: USE OF ASSISTIVE TECHNOLOGIES FOR DIGITAL SKILLS**

S/N Statement

SA A U D SD

- 1 I use a smartphone or computer for work or learning.
- 2 I use assistive technologies when operating digital devices.
- 3 Assistive technologies make learning digital skills easier for me.
- 4 I use social media or mobile apps to promote my work.
- 5 Assistive technologies have increased my confidence in using digital tools.
- 6 I have been trained on how to use assistive technologies properly.

**SECTION D: CHALLENGES IN USING ASSISTIVE TECHNOLOGIES**

S/N Statement

SA A U D SD

- 1 Assistive technologies are too expensive for me.
- 2 There is low awareness of assistive technologies among persons with

S/N Statement

SA A U D SD

physical challenges in my community.

3 Assistive devices are not easily available where I live.

4 I find it difficult to repair or maintain assistive technologies.

5 Poor electricity or internet affects my use of digital devices.

6 I do not get enough support from people around me.

**SECTION E: IMPACT OF ASSISTIVE TECHNOLOGIES ON DIGITAL SKILLS**

S/N Statement

SA A U D SD

1 Assistive technologies help me learn new digital skills easily.

2 My productivity has improved because of assistive technologies.

3 I can now access online learning materials more easily.

4 Assistive technologies help me advertise my products and services online.

5 Assistive technologies can help other persons with physical challenges improve their skills.

6 More support should be provided to persons with physical challenges to

S/N Statement

SA A U D SD

access assistive technologies.

#### Response Key

- SA – Strongly Agree
- A – Agree
- U – Undecided
- D – Disagree
- SD – Strongly Disagree

Thank you for your time and cooperation. Your responses will greatly assist this research.