



**TECHNICAL REPORT
ON
STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME (SIWES)**

**HELD AT
NIXSOFT ICT**

56, UNIVERSITY ROAD OPPOSITE EDINWO SUPERMARKET TANKE ILORIN.

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DEDICATION

This work is dedicated to my wonderful and supportive parents, **Mr. & Mrs. Esho**, as well as my amazing brothers and sisters, whose unwavering love, encouragement, and support have been a source of strength and motivation.

ACKNOWLEDGEMENT

First and foremost, I express my deepest gratitude to **God** for His continuous protection, guidance, and countless blessings throughout my **SIWES training**.

I extend my sincere appreciation to everyone who contributed in any way to the success of this training.

A special thanks to the **management of [Company Name]** and my **supervisor** for their invaluable support and mentorship, which made this experience truly rewarding.

I am immensely grateful to my beloved parents, **Mr. & Mrs. Abdulrasaq**, for their unwavering love, encouragement, and sacrifices throughout this journey.

Additionally, I appreciate my **colleagues** for their teamwork, my **siblings** for their endless support, and my **friends** for their motivation and valuable advice.

ABSTRACT

This study examines the importance of the **Student Industrial Work Experience Scheme (SIWES)** to students in the **Department of Computer Science**. Through hands-on practical applications, key research questions were addressed, and findings were systematically documented and analyzed across the chapters of this report.

The study highlights that students gained **valuable on-the-job training** and exposure to the proper use and handling of **information technology (IT) equipment** during their internship at **MLF Global Mart**.

However, the findings suggest that students' overall performance could be significantly improved with access to better research materials, **proper supervision by experienced mentors**, and a well-structured orientation on the handling of equipment and machinery.

Recommendations:

- Employers should be encouraged to accept students for **industrial training** to provide more learning opportunities.
- Each student should be assigned a **dedicated supervisor** for personalized guidance and mentorship.
- Students should be introduced to **IT practices early** to build foundational knowledge before starting the program, ensuring better comprehension and performance.

CHAPTER 1

STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME (SIWES)

The **Student Industrial Work Experience Scheme (SIWES)** is a skill development initiative introduced by the **Industrial Training Fund (ITF)** in **1973** to bridge the gap between academic knowledge and practical industry experience for students in **Engineering, Technology, and other science-related disciplines** in Nigerian higher institutions.

This program equips students with **hands-on experience**, exposing them to industry-standard **tools, equipment, and methodologies** that may not be available within their academic institutions.

SIWES was established in response to the **shortage of practical skills** among Nigerian graduates, ensuring that students acquire **industry-relevant competencies** that facilitate their transition from the classroom to the professional workspace. The program also enables students to apply their theoretical knowledge in **real-world scenarios**, thus improving their proficiency in handling industry-specific tools and machinery.

Participation in SIWES has become a **mandatory requirement** for the award of **Diploma and Degree certificates** in selected disciplines, as stipulated by the **national education policy**.

Duration of the Program

- **Four months** for Polytechnic students.

OBJECTIVE OF THE STUDY

The primary aim of this study is to evaluate the impact of **SIWES on technical skill development** within Nigeria's workforce. This assessment will help **higher institutions, industries, and other stakeholders** review their roles and contributions toward the effectiveness of the scheme.

ROLE OF THE INDUSTRIAL TRAINING FUND (ITF)

The **Industrial Training Fund (ITF)** was established under **Decree No. 47 of 1971** to pro

mote and facilitate industrial skills development across Nigeria. The agency is responsible for ensuring the availability of a well-trained **indigenous workforce** that meets the demands of various industries, contributing to national growth and economic development.

As part of its mandate, the ITF plays a critical role in the implementation of SIWES by:

- Supervising students during their industrial training.
- Organizing **orientation programs** to prepare students for their work placements.
- Disbursing **financial allowances** to eligible students.

SCOPE AND IMPORTANCE OF SIWES

SIWES is applicable to students in **monotechnics, polytechnics, and universities** across Nigeria, specifically in **science and technology-related fields**. Given the large number of participants, the scheme is managed through **collaboration between public and private sector industries**.

Significance of SIWES

The SIWES program provides numerous benefits, including:

- **Hands-on industry experience** that enhances students' practical knowledge in their respective fields.
- **Bridging the gap** between theoretical education and practical application, thereby improving students' employability.
- **Developing problem-solving skills** by enabling students to apply academic concepts to real-world challenges.

RESPONSIBILITIES OF STUDENTS AND INSTITUTIONS

Student Responsibilities

To maximize the benefits of SIWES, students are expected to:

- Show **commitment and enthusiasm** towards learning.

- Be **proactive** in seeking clarification and asking questions.
- **Adhere to the rules** and regulations of the organization where they are placed.

Institutional Responsibilities

Higher institutions play a vital role in the smooth execution of SIWES by:

- **Facilitating industrial placements** for students.
- **Providing financial support** for the supervision of students during training.
- **Assessing students' performance** during and after the program.

Through **effective collaboration** among students, institutions, and industries, SIWES remains an essential platform for equipping Nigerian graduates with **practical skills and professional experience**, making them valuable assets to the nation's workforce.

CHAPTER 2

ABOUT THE ORGANIZATION

Nixsoft ICT is a leading Information and Communications Technology (ICT) organization established to provide cutting-edge technological solutions for businesses and institutions. As an integral component of modern enterprises, its primary objective is to manage, optimize, and enhance technology to support operational goals and strategic objectives. Below is an overview of the key functions of **Nixsoft ICT**:

Infrastructure Management

Nixsoft ICT is responsible for maintaining and expanding its technological infrastructure, including **networks, servers, data centers, and cloud services**. The organization ensures these systems operate **efficiently, securely, and reliably** to support seamless operations.

Software Development and Application Management

The organization specializes in **developing and maintaining software applications** tailored to meet business needs. This includes **custom software development, integration of third-party applications, and ensuring smooth system functionality** to optimize productivity.

Information Security

Protecting sensitive data and digital assets is a top priority. **Nixsoft ICT** implements **robust security measures** such as **firewalls, antivirus software, encryption, and cybersecurity training** to mitigate risks and safeguard against cyber threats.

User Support and Helpdesk

Providing technical assistance to end-users is a crucial function. This involves **troubleshooting IT-related issues, offering guidance, and ensuring seamless interaction with technology** for employees and stakeholders.

Data Management and Analytics

The organization oversees **data storage, retrieval, and analysis** to facilitate informed decision-making. **Advanced business intelligence tools and analytics technologies** are employed to extract valuable insights and enhance operational efficiency.

Project Management

Efficient project management is vital for delivering successful IT solutions. **Nixsoft ICT** utilizes **structured project management methodologies** to ensure timely and cost-effective execution of technology initiatives.

Vendor Management

Collaboration with technology vendors and suppliers is essential. **Nixsoft ICT** engages in **contract negotiations, vendor relationship management, and evaluation of third-party services and products** to ensure efficiency and cost-effectiveness.

Compliance and Regulatory Adherence

Adhering to **industry regulations and standards** is critical, particularly in sectors such as **finance, healthcare, and e-commerce**. Compliance ensures **data protection, legal adherence, and industry best practices**.

Innovation and Strategy

Staying ahead in the tech industry requires continuous innovation. **Nixsoft ICT** actively explores **emerging technologies** and develops **IT strategies** that align with business objectives, ensuring **growth and sustainability**.

Cost Management

Effective budgeting and cost control are essential for maximizing the value of IT investments. **Nixsoft ICT** ensures that **technology expenditures** are **sustainable, cost-effective, and aligned with organizational goals**.

Disaster Recovery and Business Continuity

To minimize the impact of potential **system failures, cyber-attacks, or data breaches**, **Nixsoft ICT** has **disaster recovery and business continuity strategies** in place, ensuring uninterrupted operations.

Training and Skill Development

Keeping IT personnel **up-to-date with the latest technologies and certifications** is fundamental to maintaining a skilled workforce. **Nixsoft ICT** invests in continuous **training and skill enhancement programs** to foster professional growth.

Conclusion

In summary, **Nixsoft ICT** plays a **pivotal role** in leveraging technology to drive business success. Its functions encompass **infrastructure management, software development, cybersecurity, data analytics, strategic innovation, and IT support**—all contributing to **digital transformation and operational excellence**.

CHAPTER 3

ACTIVITIES DURING THE PROGRAM

3.1 PROGRAMMING FUNDAMENTALS (PYTHON, JAVA, C++)

Programming is a core aspect of Computer Science, enabling the development of software applications, automation, and problem-solving solutions. During my training, I worked with Python, Java, and C++, learning key programming concepts and their practical applications.

Python

Python is a high-level programming language known for its simplicity and readability. It is widely used in data science, web development, and automation.

Key Features:

- **Simple Syntax** for easy readability.
- **Dynamically Typed** language.
- **Extensive Libraries** for various applications (e.g., NumPy for data science).

Example Task: Writing a Basic Calculator in Python

```
python
CopyEdit
def calculator(a, b, operation):
    if operation == "add":
        return a + b
    elif operation == "subtract":
        return a - b
    elif operation == "multiply":
        return a * b
    elif operation == "divide":
        return a / b if b != 0 else "Cannot divide by zero"
    else:
        return "Invalid operation"

result = calculator(10, 5, "add")
print("Result:", result)
```

Java

Java is an object-oriented programming language commonly used in mobile and enterprise applications.

Key Features:

- **Platform Independence** (Write Once, Run Anywhere).
- **Strong Object-Oriented Principles** (Classes, Objects, Inheritance).
- **Robust Memory Management** with garbage collection.

Example Task: Creating a Simple Java Program to Display "Hello World"

```
java
CopyEdit
public class HelloWorld {
    public static void main(String[] args) {
        System.out.println("Hello, World!");
    }
}
```

C++

C++ is widely used for system programming, game development, and high-performance applications.

Key Features:

- **Supports Procedural and Object-Oriented Programming.**
- **Fast Execution Speed** and efficient memory management.
- **Used in Game Development, Embedded Systems, and Operating Systems.**

Example Task: Implementing a Simple C++ Program for Addition

```
cpp
CopyEdit
#include <iostream>
using namespace std;

int main() {
    int a = 5, b = 10;
    int sum = a + b;
```

```
cout << "The sum is: " << sum;  
return 0;  
}
```

3.2 DATABASE MANAGEMENT SYSTEMS (SQL, MONGODB, POSTGRESQL)

Databases store and manage structured and unstructured data efficiently. I gained hands-on experience with SQL, MongoDB, and PostgreSQL, learning how to retrieve and manipulate data.

Structured Query Language (SQL)

SQL is used to manage relational databases like MySQL and PostgreSQL.

Key Features:

- **Data Storage and Retrieval** through queries.
- **Data Manipulation** using INSERT, UPDATE, DELETE.
- **Supports Joins, Transactions, and Indexing** for optimized performance.

Example Task: Creating and Querying a Database

```
sql  
CopyEdit  
CREATE TABLE Students (  
    id INT PRIMARY KEY,  
    name VARCHAR(50),  
    age INT  
);  
  
INSERT INTO Students (id, name, age) VALUES (1, 'John Doe', 21);  
SELECT * FROM Students;
```

MongoDB (NoSQL Database)

MongoDB is a document-oriented NoSQL database.

Key Features:

- **Stores Data in JSON-like Documents** instead of tables.
- **Schema-less Structure** for flexible data storage.

- **High Scalability and Performance.**

Example Task: Inserting and Retrieving Data in MongoDB

```
json
CopyEdit
db.students.insertOne({ "id": 1, "name": "John Doe", "age": 21 });
db.students.find();
```

3.3 NETWORKING AND CYBERSECURITY

Networking and cybersecurity ensure secure communication between computer systems and protect them from threats.

Computer Networking

Networking enables devices to communicate and share resources.

Key Concepts:

- **IP Addressing & Subnetting** to organize networks.
- **TCP/IP Protocols** for secure data transmission.
- **LAN, WAN, and Wireless Communication Technologies.**

Example Task: Configuring an IP Address Using Command Line

```
bash
CopyEdit
ipconfig /all # Windows
ifconfig      # Linux/Mac
```

Cybersecurity Basics

Cybersecurity protects systems from unauthorized access and cyber threats.

Key Concepts:

- **Firewalls & Intrusion Detection Systems (IDS).**
- **Data Encryption (AES, RSA)** to secure sensitive information.
- **Ethical Hacking & Penetration Testing.**

Example Task: Encrypting a String Using Python

```
python
CopyEdit
from cryptography.fernet import Fernet

key = Fernet.generate_key()
cipher = Fernet(key)
encrypted_text = cipher.encrypt(b"Hello, Secure World!")
print("Encrypted:", encrypted_text)
```

CHAPTER 4

CHALLENGES OF ICT DURING SIWES

The rapid advancement of **Information and Communication Technology (ICT)** has reshaped various professional industries, introducing innovative tools for communication, data management, and automation. While these technological improvements have enhanced efficiency, they also come with challenges that impact workflow and professional adaptability. During my **SIWES experience at Nixsoft ICT**, I encountered several ICT-related challenges that required skill adaptation and a shift in operational approaches. These challenges are outlined below:

4.1 Digital Transformation

The adoption of ICT has led to an era of digital transformation, where organizations rely on **cloud computing, automation, and digital data management** for improved efficiency. This transition has replaced traditional paper-based systems with **digitized workflows**, requiring employees to learn and integrate new technologies.

At **Nixsoft ICT**, I observed the increasing reliance on **cloud-based platforms, software tools, and data analytics systems** for business operations. Adapting to this digital workspace demanded skills in areas such as **database management, website operations, and cybersecurity awareness**. The need for continuous learning and **technical proficiency** became evident, as mastering digital tools was essential for maximizing productivity.

4.2 Emerging Career Specializations

The **expansion of ICT** has given rise to new career specializations, requiring professionals to develop expertise in advanced technological domains. Some of the emerging areas include:

- **Software Development** – Building applications and programs to meet business needs.
- **Cybersecurity** – Protecting digital systems from cyber threats and breaches.
- **Data Science & Machine Learning** – Using AI-driven techniques to analyze and interpret data.
- **Cloud Computing & DevOps** – Managing and deploying cloud-based applications efficiently.

During my time at **Nixsoft ICT**, I noticed that employees had to adapt to **multi-disciplinary roles**, often combining **IT support, web development, and cybersecurity practices** with

hin their daily responsibilities. This shift required continuous skill development and **hands-on training** to stay relevant in a fast-changing digital landscape.

4.3 Challenges in ICT Adoption

Despite its benefits, the implementation of **ICT solutions** in a corporate environment presents several challenges, including:

- **Technical Learning Curve** – Many employees struggle to adopt complex digital tools and software applications.
- **Network Infrastructure Issues** – Unstable internet connections can disrupt work processes and limit access to cloud services.
- **Cybersecurity Risks** – The increasing reliance on digital platforms exposes organizations to cyber threats, data breaches, and phishing attacks.

While at **Nixsoft ICT**, I faced difficulties in adapting to **advanced software tools**, experienced **network connectivity disruptions**, and encountered **data security concerns** that reinforced the importance of **cybersecurity awareness**. These challenges highlighted the necessity for **regular training, IT support systems, and efficient cybersecurity measures** to maintain a smooth and secure ICT environment.

Conclusion

The integration of **ICT in modern businesses** has transformed workplace operations and introduced both opportunities and challenges. At **Nixsoft ICT**, I learned that **continuous learning, adaptability, and technical expertise** are essential for thriving in a technology-driven environment. Addressing **cybersecurity threats, network limitations, and the digital learning curve** requires proactive solutions such as **structured training programs, IT support systems, and cybersecurity awareness initiatives** to enhance overall organizational efficiency.

CHAPTER 5

CONCLUSION

My **four-month SIWES program at Nixsoft ICT** provided invaluable hands-on experience in **programming, networking, database management, and cybersecurity**. Throughout this period, I gained **practical knowledge** in applying **theoretical concepts** to real-world industry challenges, strengthening my skills in **software development, web technologies, and digital security**. This experience enabled me to explore **cutting-edge ICT solutions** while adapting to the **rapidly evolving technology landscape**.

RECOMMENDATIONS

Based on my experience and the challenges encountered, I recommend the following improvements to enhance the effectiveness of the SIWES program:

1. **Extension of SIWES Duration** – Increasing the program duration will allow students to gain deeper exposure to real-world industry practices and advanced technical skills.
2. **Provision of Monthly Allowances** – The **Industrial Training Fund (ITF)** should provide students with monthly stipends to cover transportation and other expenses, ensuring financial stability during the training period.
3. **Institutional Support for Placements** – Educational institutions and **ITF** should actively assist students in securing relevant industry placements, reducing delays in placement allocations.
4. **Enhanced Coordination and Supervision** – Organizations responsible for SIWES, including **ITF, NUC, NBTE, and NCCE**, should collaborate to ensure **effective monitoring and evaluation** of student activities. Structured supervision will help students engage in tasks directly related to their field of study.
5. **Early Industry Liaison** – SIWES managing bodies should establish partnerships with **ICT firms, software companies, and tech startups** ahead of time to reduce student rejection rates and ensure **adequate internship opportunities**.
6. **Timely Issuance of Logbooks and IT Letters** – Logbooks and internship placement letters should be provided **immediately after the first semester** to give students sufficient time to secure appropriate training positions.

7. **Career Development Support** – Institutions should consider hiring **career development experts** to guide students through industrial placements, ensuring they acquire relevant **technical and soft skills** for career advancement.

By implementing these recommendations, the **SIWES program** can significantly improve its ability to prepare students for **real-world ICT challenges**, equipping them with the necessary **practical experience** and **technical expertise** to succeed in the evolving digital era.