A TECHNICAL REPORT ON STUDENTS' INDUSTRIAL WORK EXPERIENCE SCHEME (SIWES) UNDERTAKEN AT OFFICE OF THE STATE SURVEYOR GENERAL, LAGOS.

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CHAPTER ONE: INTRODUCTION OF SIWES

The Student Industrial Work Experience Scheme (SIWES) is a significant program in the educational system of Nigeria. It is designed to bridge the gap between theoretical knowledge acquired in classrooms and practical skills needed in the workplace. This scheme is particularly crucial for students in technical, scientific, and professional disciplines, as it provides them with the hands-on experience they need to excel in their chosen careers. In this chapter, we will explore the objectives, structure, benefits of SIWES for students, employers and the Nigerian education system.

OBJECTIVES OF SIWES

The primary objective of SIWES is to provide students with practical experience in their respective fields of study. By doing so, the program aims to:

1) **Enhance Practical Skills**: Students gain hands-on experience, which helps them understand the practical aspects of their theoretical studies.
2) **Expose Students to Industry Practices**: The scheme exposes students to real-world industry practices and standards, making them more adaptable and ready for employment.
3) **Improve Employability**: By equipping students with practical skills and industry experience, SIWES enhances their employability.
4) **Build Professional Networks**: Students have the opportunity to build professional relationships that can help them in their future careers.
5) **Facilitate Career Development**: The experience gained during SIWES can help students make informed career choices and develop a clearer understanding of their professional goals.

STRUCTURE OF SIWES

The structure of SIWES involves several key stages and components:

1) **Planning and Orientation**: Before the industrial attachment begins, students undergo an orientation program. This helps them understand the objectives of SIWES, the expectations from them, and the documentation they need to maintain during their industrial training.
2) **Placement**: Students are placed in relevant industries or organizations where they can gain practical experience. This placement is usually facilitated by their institutions in collaboration with the Industrial Training Fund (ITF) and other relevant bodies.
3) **Supervision**: During the industrial attachment, students are supervised by both industry and academic supervisors. The industry supervisor is responsible for providing on-the-job training and guidance, while the academic supervisor ensures that the training aligns with the students' academic requirements.
4) **Documentation**: Students are required to maintain a logbook in which they record their daily activities and experiences. This logbook is reviewed regularly by both supervisors.
5) **Evaluation**: At the end of the industrial training period, students submit a detailed report of their experiences. This report, along with the logbook, is used to evaluate their performance. Some institutions may also require students to make presentations about their industrial training experiences.

BENEFITS OF SIWES

The SIWES program offers numerous benefits to students, educational institutions, and employers:

For Students:

a) Skill Development: Students develop practical skills that complement their academic knowledge. This hands-on experience is invaluable and can make a significant difference in their professional competence.
b) Industry Exposure: Students gain insight into the operations and culture of the industry. This exposure helps them understand industry standards and expectations, making their transition from school to work smoother.
c) Enhanced Employability: Employers often prefer candidates with practical experience. By participating in SIWES, students become more attractive to potential employers.
d) Professional Networking: The industrial attachment period allows students to meet and network with professionals in their field. These connections can be beneficial for future job opportunities and career development.
e) Personal Development: SIWES helps students develop essential soft skills such as communication, teamwork, problem-solving, and time management.

For Educational Institutions:

a) Curriculum Improvement: Feedback from industry supervisors and students can help institutions identify gaps in their curriculum and make necessary adjustments to better prepare students for the workforce.
b) Industry Collaboration: SIWES fosters collaboration between educational institutions and industries, creating opportunities for further partnerships, research, and development projects.

For Employers:

a) Talent Pipeline: Employers can identify and recruit talented students during their industrial attachment period. This provides a steady pipeline of skilled and experienced candidates for future employment.

b) Contribution to Education: By participating in SIWES, industries contribute to the educational development of future professionals. This helps in building a more skilled and competent workforce.

CHAPTER TWO: COMPANY'S PROFILE AND OPERATIONS

INTRODUCTION: OFFICE OF THE STATE SURVEYOR GENERAL, ALAUSA, IKEJA, LAGOS STATE.

VISION: Optimization of Geospatial Technology in the Attainment of Infrastructural Provision for Sustainable Economic Growth and Social Development of the State.

MISSION: Ensuring the Development of Geospatial Information for Sound Decision-Making and Good Governance.

The primary function of the Office of the State Surveyor-General is to provide an accurate survey framework to facilitate the registration of Titles under the Land Use Act. The office is charged, amongst others, with responsibilities including:

1. Initiate, formulate, execute, monitor and evaluate policies relating to Land Survey Matters.
2. Photo pointing, benchmarking and trigonometric surveys.
3. Planning and Mapping from aerial photographs and any other remote sensing technology.
4. Survey of Government development schemes in conjunction with the New Towns Development Authority and Ministry of Physical Planning and Urban Development for the purpose of:

a. Provision of around controls (horizontal and vertical) at various orders including primary, secondary, tertiary and others.

b. Land information, storage/retrieval of survey records of all State and private parcels of land.

TECHNICAL DIRECTORATES / FUNCTIONS

CADASTRAL SURVEY DIRECTORATE

- Cadastral survey i.e. Property Surveys (Perimeter & Layout) preparation of Survey Plans for Government Ministries, Departments & Agencies (MDAS)
- Cartography
- Monitoring of Engineering Surveys
- Hydrographic Surveys
- Topographic Surveys
- Issuance of Public Beacons ldentification
- Database Management of all State Schemes
- Preparation of Deed Plan/e-Survey for e-C of O

CONTROL, BOUNDARY AND MAPPING

- Delineation of intra-State boundary
- Monitoring of Local infrastructure development
- Establishment & Maintenance of Secondary and Tertiary Control Network
- Production of Maps

SURVEY CO-ORDINATION, TRANSACTION AND RECORDS

- Regulating Private Survey Practice
- Issuance of Land Information Certificate
- Issuance of Charting Information Report
- Investigative Survey Matters
- Plans, Records Archiving
- Rendering of Survey Expertise in Legal Matters

- Processing of application for consent to survey government land by private survey practitioner/Registered Surveyors

LAND INFORMATION SYSTEM SUPPORT UNIT / GEOGRAPHICAL INFORMATION SYSTEM

- Development of Land databank
- Digital Map Production
- Acquisition/Conversion, Analysis and classification of Land Data & Metadata
- Establishment of property-based information systems which support land administration, surveying planning and taxation.

PRODUCTS & SERVICES:

- Topographical Survey
- Layout Survey of Schemes
- Land Information Certificate
- Charting Information Report
- Acceptance/Lodgement of Record Copy
- Certified True Copies of Survey Plans
- Investigative Survey Services
- Surveyor-General's Consent to Survey
- Governor's Consent to assignment for mortgages/leases (Charting status determination) and subsequent transactions
- Subdivision Survey (Subsequent transactions in Government Schemes)
- Sales of Maps (OrthoPhotos, Digital Maps etc)
- Deed plans of all Government Schemes and Government Allocation

- Drainage Clearance – (Public Works Corporation, Office of Drainage Services)
- Preparation of Composite plans – (Litigants, Judiciary (Court), EFCC, NPF)
- Preparation of Survey descriptions for Village Excisions, Acquisitions, Revocations etc.
- Preparation of Claim sheets and Surveys for Compensation on Acquisition)
- Survey description for ROW (Route, Pipeline, Gas Line)- (DPR for Oil and Gas Companies)

CHAPTER THREE: SOFTWARES USED

1. AUTOCAD

As a surveyor, I find AutoCAD to be an incredibly powerful tool that greatly enhances my ability to create accurate maps and site plans. My job involves measuring and mapping land areas, and I rely heavily on precision and detail in my work. AutoCAD helps me achieve these goals with its advanced drafting and design capabilities. Let me explain how I apply AutoCAD in my daily work as a surveyor.

One of my primaries uses for AutoCAD is to generate detailed maps and site plans. When I collect data from the field using tools like GPS and total stations, I bring that data back to my office and input it into AutoCAD. This data includes measurements of land features, boundaries, and elevations. AutoCAD allows me to create precise maps that accurately depict the surveyed area. These maps are essential for planning construction projects, defining property boundaries, and ensuring legal compliance.

AutoCAD's precision is a huge advantage for me. The software enables me to draw with exact measurements, ensuring that every line and point is accurately placed. This precision is crucial

when defining property boundaries, as even a small error can lead to disputes and legal issues. By using AutoCAD, I can produce clear and accurate drawings that help avoid such problems.

Another important feature of AutoCAD in my work is its ability to handle large datasets. Surveying often involves collecting a vast amount of data, especially for large projects like highways, subdivisions, or commercial developments. AutoCAD manages this data efficiently, allowing me to create comprehensive maps that include all necessary details. The software also supports layers, enabling me to organize my drawings better by separating different elements, such as topography, infrastructure, and vegetation.

AutoCAD's 3D modeling capabilities are also beneficial for my more complex projects. With 3D capabilities, I can create three-dimensional representations of the land, showing elevations and contours more accurately. This is particularly useful for projects involving terrain analysis, where understanding the land's shape and features is essential. 3D models help in planning construction activities, such as grading and excavation, by providing a clear view of the land's topography.

Collaboration and sharing are other areas where AutoCAD excels in my work. Surveying projects often involve multiple stakeholders, including clients, architects, engineers, and government officials. AutoCAD allows me to share my drawings in widely accepted formats like DWG and DXF. This compatibility ensures that everyone involved in the project can view and work with the same data, facilitating better communication and coordination. Additionally, AutoCAD's cloud services enable real-time collaboration, allowing multiple users to work on the same project simultaneously.

AutoCAD also integrates well with other tools and software that I use. For example, data collected from GPS devices and total stations can be imported directly into AutoCAD, streamlining my

workflow. This integration reduces the need for manual data entry, minimizing errors, and saving time. Furthermore, AutoCAD's compatibility with GIS (Geographic Information Systems) allows me to combine my data with other spatial information, enhancing my analysis and decision-making processes.

In conclusion, AutoCAD is an invaluable tool in my work as a surveyor. Its precision, ability to handle large datasets, 3D modeling capabilities, and support for collaboration make it essential for creating accurate maps and site plans. By using AutoCAD, I can produce detailed and reliable drawings that are crucial for successful surveying projects. As technology continues to advance, I am confident that AutoCAD will remain a vital resource, helping me perform my work with greater efficiency and accuracy.

2. GLOBAL MAPPER

As a surveyor, I use both Global Mapper and AutoCAD to handle different aspects of my work, and they complement each other well. Here's how I use Global Mapper in relation to AutoCAD.

Global Mapper is my go-to software for processing and analyzing spatial data. When I collect data from the field using tools like GPS and total stations, I first import this data into Global Mapper. The software supports various file formats, making it easy to integrate data from different sources. In Global Mapper, I can view and analyze the terrain, visualize elevation data in 3D, and process point cloud data from LiDAR surveys. This helps me understand the land's features and prepare accurate maps.

One of the key tasks I perform in Global Mapper is georeferencing. This ensures that all my spatial data aligns correctly with real-world coordinates. I often work with aerial images and satellite data,

and Global Mapper allows me to align these images accurately. Once the data is processed and analyzed, I export it in formats that are compatible with AutoCAD, such as DXF or SHP files.

After exporting the data, I open it in AutoCAD. AutoCAD is excellent for creating detailed and precise drawings. In AutoCAD, I use the data from Global Mapper to create maps, site plans, and detailed layouts. The precise measurements and spatial data I processed in Global Mapper help me produce accurate and reliable drawings in AutoCAD. I can draw property boundaries, design infrastructure, and prepare construction plans with a high degree of accuracy.

Using Global Mapper and AutoCAD together enhances my workflow. Global Mapper's strength in data processing and analysis combined with AutoCAD's precision in drafting and design ensures that I can deliver high-quality maps and plans. This combination allows me to work more efficiently and effectively, ensuring that every project meets the required standards and specifications.

3. GOOGLE EARTH

As a surveyor, I use Google Earth to enhance my work in various ways. Google Earth is a powerful tool that provides detailed satellite imagery, 3D terrain models, and geographic data, which helps me visualize and plan my projects effectively. Here's how I use Google Earth in my daily tasks.

One of the primary uses of Google Earth in my work is site reconnaissance. Before I visit a site, I use Google Earth to get a preliminary look at the area. The satellite imagery helps me understand the terrain, identify major features like roads, buildings, and bodies of water, and assess any potential obstacles. This initial overview saves time and helps me plan my fieldwork more efficiently.

Google Earth is also valuable for creating maps and locating coordinates. I can easily enter specific coordinates to pinpoint exact locations on the map. This feature is particularly useful when I need to identify property boundaries or locate specific landmarks. By marking these points on Google Earth, I can visualize the layout of the area and plan my survey accordingly.

Another useful feature of Google Earth is its ability to measure distances and areas. Using the measurement tool, I can quickly estimate distances between points or calculate the area of a particular region. This capability is helpful when I need to make rough calculations or verify measurements before conducting a detailed survey.

Google Earth's 3D terrain modeling is also a significant advantage. It allows me to view the topography of an area in three dimensions, giving me a better understanding of the landscape. This 3D view is especially beneficial for projects involving elevation changes, such as construction planning or land development. It helps me anticipate challenges related to the terrain and make informed decisions about the project.

Additionally, Google Earth enables me to import and export data. I can import KML or KMZ files containing geographic data, which allows me to overlay additional information on the map. This feature is useful for integrating data from other sources and creating comprehensive maps. Likewise, I can export my marked points and paths from Google Earth and use them in other software like AutoCAD or GIS applications.

Lastly, Google Earth is a valuable communication tool. When discussing projects with clients or team members, I can use Google Earth to provide a visual representation of the site. This makes it easier to explain the layout, share findings, and collaborate effectively.

In conclusion, Google Earth is an essential tool in my work as a surveyor. It helps me conduct preliminary site assessments, locate coordinates, measure distances and areas, view 3D terrain, and communicate effectively with clients and colleagues. By leveraging the features of Google Earth, I can perform my job more efficiently and accurately.

CHAPTER FOUR: EXPLANATION OF A WORK CARRIED OUT AND THE STAGES

As surveyors, our team carried out a memorable on-site project for a land subdivision intended for a new residential development. The objective was to divide a large parcel of land into smaller lots for housing while ensuring compliance with local zoning regulations and maintaining accurate property boundaries. Here's a detailed explanation of the process and the work involved:

PROJECT PLANNING AND PREPARATION

Before heading to the site, we conducted a thorough review of existing maps, land records, and zoning regulations. Using tools like Google Earth and AutoCAD, we created preliminary layouts and marked key points of interest. This preparation helped us understand the terrain, identify any potential obstacles, and plan the survey efficiently.

FIELDWORK

Equipment and Team: On the day of the survey, we brought essential equipment, including a total station, GPS unit, measuring tapes, and marking tools. Our team consisted of three members to assist with setting up equipment and taking measurements.

Establishing Control Points: The first step was to establish control points around the site. These are known reference points that serve as a basis for all subsequent measurements. Using the GPS unit, we located existing benchmarks and set up new control points with precise coordinates. This ensured a solid foundation for accurate measurements.

Boundary Survey: Next, we conducted a boundary survey to determine the exact perimeter of the parcel. Using the total station, we measured distances and angles between control points and

existing boundary markers. Team members assisted by holding the prism poles and marking points on the ground. Accurate boundary measurements are crucial for legal purposes and to prevent disputes with neighboring properties.

Topographic Survey: After the boundary survey, we performed a topographic survey to capture the site's terrain features. This included measuring elevations, slopes, and significant features such as trees, buildings, and utility lines. The total station and GPS unit were used to record these details. The data collected was later used to create a detailed topographic map, essential for designing the subdivision layout.

Data Processing: Back at the office, we imported the field data into AutoCAD and Global Mapper. Using these tools, we processed the measurements and created detailed maps and layouts. The boundary data was used to draw precise property lines, while the topographic data helped design the subdivision layout, considering the natural terrain and existing features.

Creating the Subdivision Plan: With the processed data, we developed a subdivision plan that divided the land into individual lots. This plan included streets, utility lines, drainage systems, and green spaces. We ensured that the design met all zoning regulations and provided adequate access and amenities for future residents.

Final Steps and Reporting: Once the subdivision plan was completed, we prepared a detailed report including maps, measurements, and legal descriptions of the new lots. This report was submitted to local authorities for approval and used by engineers and construction teams during development.

Conclusion: This project was a comprehensive exercise that required meticulous planning, precise fieldwork, and detailed data processing. By leveraging modern surveying tools and technologies

like GPS, total stations, Google Earth, and AutoCAD, we were able to create an accurate and compliant subdivision plan. This not only facilitated the development process but also ensured the new residential area was well-designed and functional for future homeowners.

CHAPTER FIVE: PROBLEMS ENCOUNTERED

The Student Industrial Work Experience Scheme (SIWES) is undoubtedly a crucial program for bridging the gap between classroom learning and practical experience. However, despite its many benefits, SIWES is not without its challenges. These challenges can significantly impact the overall effectiveness of the program and the experiences of the students involved.

Placement Issues

One of the most significant challenges of SIWES is securing relevant placements for all students. This issue is particularly pronounced in regions with limited industrial activities or specific industries. Students often struggle to find organizations that are willing to take them on for their industrial training. This can be a source of immense frustration and anxiety, especially for students who are eager to gain experience in their specific field of study.

Financial Constraints

Financial constraints pose another significant challenge for many students. The cost of transportation, accommodation, and other expenses during the industrial attachment can be burdensome. While some institutions or companies provide stipends, these are often insufficient to cover all expenses, leaving students to bear the additional costs.

Supervision Challenges

Effective supervision is essential for the success of SIWES, but it is often a challenge. Both industry and academic supervisors play crucial roles in guiding students, yet ensuring regular and meaningful supervision can be difficult. Busy schedules and geographical distances can hinder supervisors from providing the necessary support and feedback.

Balancing Academic and Industrial Requirements

Balancing academic responsibilities with the demands of industrial attachment can be overwhelming for many students. Some students have to complete coursework or projects alongside their SIWES, leading to a stressful and exhausting experience.

CHAPTER SIX: RECOMMENDATIONS AND CONCLUSION

RECOMMENDATIONS

The challenges of SIWES, from securing placements and ensuring quality training to financial constraints and inadequate supervision, can significantly affect the experiences and outcomes for students. These challenges highlight the need for better support systems, more effective collaboration between educational institutions and industries, and increased financial aid to ensure that students can fully benefit from the program. Addressing these issues can help make SIWES a more enriching and valuable experience, enabling students to gain the practical skills and confidence needed to excel in their professional careers.

The Impact of SIWES on students and the Nigerian education system is profound. By providing practical experience, SIWES helps students become more competent and confident professionals. The scheme plays a crucial role in reducing the skill gap between graduates and industry requirements, thereby enhancing the overall quality of the workforce.For the education system, SIWES promotes a more practical and hands-on approach to learning. Institutions that actively participate in SIWES are better positioned to produce graduates who are well-prepared for the challenges of the modern workplace. This not only benefits the students but also boosts the reputation of the institutions.

CONCLUSION

The Student Industrial Work Experience Scheme (SIWES) is an essential component of higher education in Nigeria. By providing students with practical experience, it bridges the gap between theoretical knowledge and real-world application. Despite facing challenges such as placement issues, varying quality of training, and financial constraints, SIWES offers significant benefits to

students, educational institutions, and employers. The scheme enhances students' practical skills, improves their employability, and fosters valuable industry-academia collaboration. As such, SIWES plays a crucial role in shaping the future of Nigeria's workforce and contributing to the nation's economic development.