

TECHNICAL REPORT

ON

STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME (SIWES 2)

UNDERTAKEN AT

**NATIONAL INSTITUTE FOR PHARMACEUTICAL RESEARCH AND DEVELOPMENT (NIPRD), 1 IDU INDUSTRIAL LAYOUT, IDOGWARI, ABUJA**

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**CHAPTER ONE**

**S**tudent Industrial Work Experience Scheme

1.0 INTRODUCTION

The Students Industrial Work Experience Scheme (SIWES) is a skills training programme designed to facilitate smooth transition from the classroom to the world of work. The Scheme exposes students of Universities, Polytechnics/Colleges of Technology/Colleges of Agriculture and Colleges of Education to industry based skills necessary for a smooth transition from the classroom to the world of work. It prepares students for the industrial work situation that they are likely going to meet after graduation.

1.1 HISTORY OF SIWES

In Nigeria, the problem of lack of adequate practical skills preparatory for employment industries by Nigerian graduates of tertiary institutions has been long recognized.

In 1973, the Federal Government of Nigeria introduced the national policy on industrial training called SIWES. This program is under the umbrella of the Ministry of Education through the Industrial Training Fund (ITF), was designed to help students acquire the necessary practical education experience in their fields of study and other related professions. It affords students of tertiary institutions the opportunity of being familiarized and exposed to the needed experience in handling machinery and equipments which are not usually available in the educational institutions.

One of the primary goals of SIWES is to help students integrate leadership development into the experiential learning process and to bridge the existing gap between the theory taught in the classroom and the practice of science, agriculture, medicine, engineering, technology and other professional programs in the Nigerian tertiary institutions.

SIWES is an accepted skills programme and participation in SIWES has become a necessary pre-condition for the award of Diploma and Degree certificates in accordance with the education policy of government.

1.2 VISION OF SIWES

The vision of SIWES is to prepare students to contribute to the productivity of their nation.

1.3 MISSION OF SIWES

SIWES is charged with the responsibility of promoting and encouraging the acquisition of skill, commerce and industry, with the view to generating a pool of trained indigenous manpower sufficient to meet the needs of the economy.

1.4 AIM OF SIWES

SIWES is aimed at developing the human resources of the nation. It builds the nation’s work force to promote the economy of a nation.

1.5 OBJECTIVES OF SIWES

Some objectives of SIWES include:

* Provision of an avenue for students to acquire industrial skill and experience during their course of study.
* To provide students with the opportunities to apply their educational knowledge in real work situations, thereby bridging the gap between theory and practice.
* Expose students to work methods and techniques in handling equipment and machineries that may not be available in the university.
* To provide students the opportunity to develop attitudes conducive to effective interpersonal relationships, the opportunity to understand informal organizational interrelationships and increase a student’s sense of responsibility as well as to acquire good work habits
* To prepare students to enter into fulltime employment in their area of specialization upon graduation and to develop employment records/references that will enhance employment opportunities.

**CHAPTER TWO**

AREA OF PLACEMENT: National Institute of Pharmaceutical Research and Development (NIPRD)

2.0 HISTORY OF NIPRD

In Nigeria, the need for the advancement of indigenous pharmaceutical research and development (R&D) in order to enhance Development and commercialization of pharmaceutical raw materials, drugs and biological products has long been recognized.

Therefore in 1987, the federal Government approved the establishment of the National Institute for Pharmaceutical Research and Development (NIPRD) as a parastatal under the Federal Ministry of Science and Technology. This approval was based on the recommendation of the pharmaceutical society of Nigeria (PSN).  
The Institute was established under the Science and Technology Act of 1980 with the primary objective of developing drugs, biological products and pharmaceutical raw materials from indigenous resources.

2.1 VISION OF NIPRD

To build a centre of excellence in research and development of phytomedicines, pharmaceutical and biological products and diagnostics towards improving the health and well-being of man-kind.

2.2 MISSION OF NIPRD

* To apply appropriate modern science and technological resources to stimulate local production of drugs through effective collaboration with the industry and experts within and outside Nigeria.
* Develop quality standards for phytomedicine.
* Drugs and diagnostics for the purpose of control and regulation.
* Develop herbal and phytomedicines to pilot state of commercialization.
* Provide quality assurance services on all drugs used in healthcare delivery.
* Provide safety data and essential information on herbal and other towards achieving self-sufficiency in the production and control of essential drugs in such a way that would guarantee the overall health of Nigerians and mankind in general.

2.3 FUNCTIONS OF NIPRD

NIPRD, which formally took off in January 1989, has several functions, some of which are listed below:

* Undertake research and development work on drugs, biological products including vaccines and pharmaceutical raw materials from indigenous natural resources and by synthesis using appropriate science and technology methodologies.
* Conduct appropriate investigations and consequent applications in the areas of evaluation, preservation, purification, standardization, safety and rational utilization of traditional medicine.
* Develop methodologies for quality assessment of biological products, orthodox and herbal medicines including their raw materials.
* Serve as reference centre for research work on the biopharmaceutics, pharmacokinetics, storage and stability of imported and locally manufactured drugs and biological products.
* Conduct research and development work into pharmaceutical biotechnology, nutrition, cosmetics and environmental science for improved quality of life and the conservation of medicinal and aromatic plants.
* Promote and sponsor the local development and production of drugs, vaccines pharmaceutical machinery, devices and accessories.

2.4 VARIOUS DEPARTMENTS OF NIPRD

(A) Office of the Director General (oversees the entire Institute, but however has some Units directly under its supervision). These Units include;

1. NIPRD Research Clinic
2. Legal Unit;
3. Protocol/Public Relations Unit
4. Consultancy Unit (NIPRD CONSULT)
5. ICT Unit
6. Library, Information and Documentation Services Unit
7. Procurement Unit
8. Audit Unit;
9. SERVICOM Unit; and
10. Planning, Monitoring & Evaluation.

(B)Microbiology & Biotechnology

(C) Medicinal Chemistry & Quality Control

(D) Medicinal Plant Research & Traditional Medicine

(E) Pharmacology & Toxicology

(F) PT & RMD

**CHAPTER THREE**

3.0 Work carried out during the SIWES training

3.1 ACUTE ORAL TOXICITY STUDY

AIM: To determine the toxicity of proposed test drugs or extracts.

MATERIALS: Observation cages, Animals (Albino Rats), Test drug or extract (e.g *Cyperus articulatus)*, Pen, Acute toxicity sheet, Laboratory coats, Gloves.

INTRODUCTION: Acute toxicity refers to the unwanted effects of a drug (or chemical substance) that occurs either immediately after administration or at a short time interval after a single or multiple administration of such substance within 24 hours.

AIM: Studies of acute toxicity are used to establish the dose-dependent unwanted (or adverse) effect(s) which may take place. It is also useful in quantifying the LD50 and ED50 of the chemical entity.

PROCEDURE:

The proposed test drug is administered orally to the animals. The animals are then placed in observation cages where they are monitored for 5, 10,15 and 30 minutes after the administration.. parameters such as tail biting, licking, convulsion, sedation, diarrhea, paw licking, scratching stretching etc. are observed and recorded at 1 hour, 2 hours, up till 24 hours after administration on the data sheet provided. The observations are graded as: + for mild, ++ for moderate, and +++ for severe depending on the severity and frequency of the action.

RESULT: The animals exhibited no significant effects.

CONCLUSION: The tested drug/extracts is free from acute toxicity.

3.2 FORCED SWIM TEST

AIM: To determine the antidepressant effect of a proposed drug/extract.

MATERIALS: Animals(Albino Rats), Observation cages, Transparent tank, Stop Watch, Unknown test extract, Laboratory coats, Gloves, Face mask.

INTRODUCTION: The forced swim test is a behavioural test used in the screening of potential antidepressant drugs, and assessing of other manipulations that are expected to affect depression related behaviours.

PROCEDURE: The rats were placed in an inescapable transparent tank that is filled with water and their escape related mobility behavior was recorded. Unwanted stress and distractions were limited and the behaviours manifested were assessed.

3.3 TAIL SUSPENSION TEST

AIM: To determine the antidepressant effect of a proposed drug/extract.

MATERIALS: Animals(Albino Rats), Observation cages, Transparent tank, Stop Watch, Unknown test extract, Laboratory coats, Gloves, Face mask.

INTRODUCTION: The tail suspension test is a behavioral test used for evaluating antidepressant drugs, antidepressant efficacy of new compounds and experimental manipulations that are aimed at rendering or preventing depressive-like states.

PROCEDURE: the test was carried out for typically 6 minutes for each animal. The rats were suspended by ¾ of their tails with tape. The position is such that the animal cannot escape or hold on to nearby surfaces. The first minute is for acclimatization and from the second minute up till the sixth minute, the resulting escape oriented behavior is quantified.

3.4 XYLENE-INDUCED EAR EDEMA TO ASSESS THE ANTI-INFLAMMATORY PROPERTIES OF *LANDOLPHIA OWARIENSIS*

AIM: To assess the anti-inflammatory properties of *landolphia owariensis*

MATERIALS: Animals(Albino Rats), Observation cages, aqueous extract of *landolphia owariensis* Syringes*,* Laboratory coats, Gloves, Face mask.

INTRODUCTION:

PROCEDURE: the rats were weighed and their individual weights were used to calculate the doses of plant extract to be administered. Experiments were carried out according to Shang et al. method. The acute inflammation was induced on the anterior and posterior surfaces of the right ear by the topical application of 30μL/ear of xylene. The extract was applied simultaneously with xylene and indomethacin was used as the standard drug. One hour later, the animals were euthanized and two ear punches (6 mm diameter) were taken from each rat and weighed. The increase in the weight of the right ear punch compared to the left ear indicated the presence of edema. iysf9517

RESULTS: There was a considerable reduction of the inflammation.

CONCLUSION: The plant extract was able to reduced the ear edema.

3.5 Murder, Magic and Medicine (A seminar)

*Murder*

Poisonous plants have been used for hunting, execution and warfare. Calabar beans have been used in prehistoric judicial systems. The accused is subjected to a dangerous trial known as “trial by ordeal” where they are fed with the seeds of the calabar bean and it was believed that the gods would miraculously rescue an innocent person and guilt would be proven if the person dies. Scientifically proven, calabar bean (*Physostigma venenosum)* is poisonous when chewed. The poisonous properties of the calabar bean are mostly due to the presence of physostigmine alkaloid which acts on the nervous system.

*Magic*

The description of hallucinogenic effect elicited by Ololiuqui which is a magical preparation. In 1651, Francis Hernadres published a report titled Rarum Medcarum. This publication contained a detailed description of plant extract ololiuqui) and how to prepare and use it. Francis Hernadres carried out various investigations between 1570-1575 and this brought about the publication in 1651. During the primitive times, when the priests wanted to commune with their gods, they ate the ololiuqui plant and a thousand visions and satanic hallucinations came upon the priests and this facilitated the passing of information from the gods to the people through the priests.

*Medicine*

Majority of the plants used in murder and magic in prehistoric times have gained scientific recognition as medicinal herbs for example, Calabar bean contain 2 major alkaloids which are calabarine and physostigmine. Physostigmine has been proven to disrupt communication between the nerves and organs and this results in contraction of the pupils, profuse salivations, seizures and death by asphyxiation.

**CHAPTER FOUR**

4.1 Summary of SIWES activities

During the course of the three (3) months training, several experiments were done such as; Isolated tissue experiment, Acute oral toxicity studies, Trypanosomes study, Acetic acid induced writhing, Anti-depressant study, Anti-convulsant studies, Acetic acid induced ear edema model to determine the anti-inflammatory properties of *Cyperus articulatus*, Castor oil induced diaarhea to check the anti-diarrhea properties of *Moringa oleifera*, Xylene-Induced ear edema to assess the anti-inflammatory properties of *Landolphia owariensis.*

The interns and other staffs of the department of Pharmacology and Toxicology (P&T) at NIPRD also taught several lectures. They include; Inflammation, Methods of blood collection in laboratory animals, Pharmacokinetics, Murder, Magic and Medicine, Extraction methods, The 3 R’s of animal research, etc.

4.2 PROBLEMS ENCOUNTERED DURING THE PROGRAM

The major problem encountered during was the stress of job placement and accommodation. Securing a place to work was a bit difficult because most organizations did not accept SIWES trainees for less than 6 months. Transportation was another problem due to the bad road and hold-up on the way to the Institute.

4.3 RECOMMENDATION

I would suggest that the institution should handle the SIWES placement. The school should contact the relevant organizations on behalf of the students order to reduce the problem of job placements.

In addition, organizations should be enlightened about the SIWES program and they should be mandated to make slots available for students undergoing the SIWES program irrespective of the duration of the program.

4.4 CONCLUSION

I really enjoyed my work experience because I learnt a lot pertaining to pharmaceutical research. The knowledge I obtained was useful in understanding the theoretical principles taught in school. I was also able to interact with a larger spectrum of people in the industrial set-up and this helped in developing interpersonal relational skills and work ethics. In a nutshell, a tremendous amount of knowledge was acquired during the course of the SIWES training.

4.5 REFERENCES

1. Personal SIWES journal.
2. Student’s Industrial Work Experience Scheme (SIWES) guide: Afe Babalola University, Ado-ekiti, Ekiti State.