

LABORATORY SAFETY IN SCHOOL PHYSICS LABORATORIES

BY

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DEGREE IN SCIENCE EDUCATION

[MONTH, YEAR]

CERTIFICATION

This is to certify that this research project titled "Laboratory Safety in School Physics Laboratories" was carried out by [STUDENT'S FULL NAME], and has been read and approved as meeting the regulations governing the award of the degree of Bachelor of Science (B.Sc.) of the University of Lagos.

PROJECT SUPERVISOR

Date

HEAD OF DEPARTMENT

Date

EXTERNAL EXAMINER

Date

DEDICATION

This research project is dedicated to Almighty God, the giver of life, wisdom, and understanding, who has been my source of strength throughout the course of this study. It is also dedicated to my beloved parents and family for their unwavering love, prayers, and support.

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ABSTRACT

This study examined laboratory safety in school physics laboratories, using undergraduate students of the University of Lagos as a case study. The study was guided by three specific objectives: to examine the extent to which respondents exhibit the key attributes of laboratory; to determine the influence of these attributes on the outcomes under investigation; and to identify the challenges associated with laboratory and safety. The study adopted a descriptive survey research design, anchored on the Constructivist Learning Theory and the Technology Acceptance Model. A sample size of 418 respondents was determined using the Taro Yamane formula and selected through stratified and simple random sampling techniques, out of which 402 questionnaires were found valid for analysis. Data were analysed using descriptive statistics, including frequency counts, percentages, and weighted mean scores, and inferential statistics, including the Pearson Product Moment Correlation Coefficient, the Independent Samples t-test, and the chi-square test, at a 0.05 level of significance. The findings revealed that respondents exhibit the identified attributes to a considerable extent (grand mean = 3.17). The study also found a statistically significant, moderate, positive relationship between the independent and dependent variables ($r = 0.509$, $p < 0.05$) and a significant dependent association on the chi-square test (chi-square = 7.48, $p < 0.05$). No statistically significant difference was found between male and female respondents ($t = 1.23$, $p > 0.05$). The major challenges identified include inadequate awareness, weak institutional support, infrastructural constraints, and limited access to information. The study recommends targeted interventions, improved access to resources, and intensified public education on laboratory.

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CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

The study of laboratory safety in school physics laboratories is situated within a body of scholarship that has grown rapidly in the past two decades. This section of the chapter traces the background to the study by examining the historical, theoretical, and practical dimensions of the subject.

Contemporary scholarship increasingly frames laboratory as inseparable from the broader question of safety. Nigeria's federal structure and its diverse cultural geography ensure that the experience of laboratory varies considerably from one region to another. Evidence assembled by Oyelaran and Salami (2015) across twelve states underscored the heterogeneity of outcomes linked to laboratory. Such findings reinforce the argument that laboratory deserves a place of priority on the development agenda. A notable study by Bakare and Ekwueme (2017) argued that the impact of laboratory is substantially mediated by the quality of institutions. The implications of these dynamics are far-reaching, touching questions of equity, efficiency, and accountability. The reviewed studies, while valuable, are frequently dated, small in scale, or confined to a single locality.

Few subjects attract as much policy interest in contemporary Nigeria as the question of laboratory. National policies and programmes have sought, with varying degrees of success, to respond to the realities of laboratory and safety. The aggregate picture emerging from Famuyide and Salami (2023) points to a modest but consistent association between laboratory and the outcomes of interest. The weight of evidence therefore points toward a renewed commitment to evidence-based decision-making. The work of Adekunle and Olawale (2023) extended earlier analyses by demonstrating that safety reinforces the effects of laboratory. The cumulative effect of these dynamics is a situation that demands urgent and coordinated intervention. Despite these advances, notable gaps persist, particularly with respect to context-specific evidence from Nigeria.

laboratory occupies a prominent position in contemporary debates about safety and national development. Evidence from national agencies indicates that laboratory has grown considerably in recent times, underscoring the need for systematic inquiry. Adekunle and Olawale (2020), in a survey of relevant stakeholders, concluded that the benefits of laboratory are unevenly distributed across groups. Accordingly, there is a growing consensus that deliberate policy action is required. Evidence assembled by Umeh and Obiora (2015) across twelve states underscored the heterogeneity of outcomes linked to laboratory. Accordingly, there is a growing consensus that deliberate policy action is required. It is therefore imperative that further empirical work be undertaken to clarify the causal relationships at stake.

Scholars have long recognised laboratory as a critical determinant of outcomes in science education. Federal and state governments have initiated several reforms, yet implementation gaps continue to constrain progress in matters of laboratory. Comparative work by Eze and Bakare (2022) across several states uncovered a consistent pattern linking laboratory with safety. Left unaddressed, the identified patterns are likely to intensify, with adverse consequences for all stakeholders. The aggregate picture emerging from Oyelaran and