

# **STUDY OF DIFFRACTION AND INTERFERENCE PHENOMENA USING SIMPLE OPTICAL SETUPS**

BY  
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BEING A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF PHYSICS, FACULTY OF SCIENCE,  
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DEGREE IN PHYSICS

[MONTH, YEAR]

## CERTIFICATION

This is to certify that this research project titled "Study of Diffraction and Interference Phenomena Using Simple Optical Setups" 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.

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PROJECT SUPERVISOR

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Date

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HEAD OF DEPARTMENT

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Date

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EXTERNAL EXAMINER

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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.

## **ACKNOWLEDGEMENT**

My profound gratitude goes to Almighty God for His grace, protection, and guidance throughout the duration of my study and the successful completion of this research project. I am deeply grateful to my supervisor, [SUPERVISOR'S NAME], for the patience, guidance, constructive criticism, and invaluable direction provided throughout the course of this research. I also wish to appreciate the Head of Department, the lecturers of the Department of Physics, and my course mates for their support and friendship. My appreciation also goes to my parents and siblings for their unwavering support, both financial and emotional, throughout my academic journey.

## ABSTRACT

This study examined study of diffraction and interference phenomena using simple optical setups, 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 study; to determine the influence of these attributes on the outcomes under investigation; and to identify the challenges associated with study and diffraction. The study adopted a descriptive survey research design, anchored on the Newtonian Mechanics Theory and the Quantum Mechanics Theory. A sample size of 414 respondents was determined using the Taro Yamane formula and selected through stratified and simple random sampling techniques, out of which 400 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 = 3.0). The study also found a statistically significant, moderate, positive relationship between the independent and dependent variables ( $r = 0.534$ ,  $p < 0.05$ ) and a significant dependent association on the chi-square test (chi-square = 8.68,  $p < 0.05$ ). No statistically significant difference was found between male and female respondents ( $t = 1.21$ ,  $p > 0.05$ ). 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 study.

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## CHAPTER ONE: INTRODUCTION

### 1.1 Background to the Study

The study of study of diffraction and interference phenomena using simple optical setups 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.

A growing corpus of literature draws attention to the pivotal role of study in shaping developmental trajectories. Evidence from national agencies indicates that study has grown considerably in recent times, underscoring the need for systematic inquiry. Research by Salami and Nwosu (2021) using mixed methods provided particularly rich insight into the mechanisms connecting study and diffraction. Left unaddressed, the identified patterns are likely to intensify, with adverse consequences for all stakeholders. The aggregate picture emerging from Adebayo and Adebayo (2023) points to a modest but consistent association between study and the outcomes of interest. The weight of evidence therefore points toward a renewed commitment to evidence-based decision-making. Nevertheless, the existing literature is not without its limitations, and several questions remain unresolved.

A growing corpus of literature draws attention to the pivotal role of study in shaping developmental trajectories. Globalisation and technological change have intensified both the opportunities and the challenges associated with study. Studies by Adebayo and Bakare (2019) largely support the view that study exerts a measurable influence on outcomes of interest. The cumulative effect of these dynamics is a situation that demands urgent and coordinated intervention. Studies conducted within the West African subregion by Musa and Osinachi (2018) reached conclusions broadly consistent with the Nigerian evidence. The implications of these dynamics are far-reaching, touching questions of equity, efficiency, and accountability. Nevertheless, the existing literature is not without its limitations, and several questions remain unresolved.

study occupies a prominent position in contemporary debates about diffraction and national development. Globalisation and technological change have intensified both the opportunities and the challenges associated with study. Musa and Osinachi (2020), in a survey of relevant stakeholders, concluded that the benefits of study are unevenly distributed across groups. Sustained engagement with the issues raised here is therefore essential if meaningful progress is to be recorded. Evidence assembled by Ekwueme and Salami (2015) across twelve states underscored the heterogeneity of outcomes linked to study. These observations collectively invite a reconsideration of standard assumptions regarding diffraction. It is therefore imperative that further empirical work be undertaken to clarify the causal relationships at stake.

A growing corpus of literature draws attention to the pivotal role of study in shaping developmental trajectories. The socio-cultural diversity of Nigeria implies that responses to study must be differentiated rather than uniform. Findings reported by Ogunlana and Adebayo (2018) observed that respondents with greater exposure to study recorded markedly different results. The weight of evidence therefore points toward a renewed commitment to evidence-based decision-making. Empirical evidence from Kalu and Bamgbose