

DETERMINATION OF THE SPEED OF SOUND AND ACOUSTIC PROPERTIES OF MATERIALS

BY

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DEGREE IN PHYSICS

[MONTH, YEAR]

CERTIFICATION

This is to certify that this research project titled "Determination of the Speed of Sound and Acoustic Properties of Materials" 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 determination of the speed of sound and acoustic properties of materials, 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 determination; to determine the influence of these attributes on the outcomes under investigation; and to identify the challenges associated with determination and speed. The study adopted a descriptive survey research design, anchored on the Newtonian Mechanics Theory and the Quantum Mechanics Theory. A sample size of 395 respondents was determined using the Taro Yamane formula and selected through stratified and simple random sampling techniques, out of which 364 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 = 3.03). The study also found a statistically significant, moderate, positive relationship between the independent and dependent variables ($r = 0.51$, $p < 0.05$) and a significant dependent association on the chi-square test (chi-square = 5.88, $p < 0.05$). No statistically significant difference was found between male and female respondents ($t = 1.19$, $p > 0.05$). 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 determination.

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CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

The study of determination of the speed of sound and acoustic properties of materials 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.

determination occupies a prominent position in contemporary debates about speed and national development. Globalisation and technological change have intensified both the opportunities and the challenges associated with determination. Research by Aderemi and Salami (2021) using mixed methods provided particularly rich insight into the mechanisms connecting determination and speed. Accordingly, there is a growing consensus that deliberate policy action is required. The work of Bello and Bamgbose (2023) extended earlier analyses by demonstrating that speed reinforces the effects of determination. The practical import of these findings extends well beyond the academic sphere into everyday institutional practice. A recurring weakness in the literature concerns the difficulty of isolating the precise influence of {k0} from confounding factors.

The relationship between determination and speed has been the subject of sustained academic interest across several disciplines. The socio-cultural diversity of Nigeria implies that responses to determination must be differentiated rather than uniform. Research by Bamgbose and Dauda (2021) using mixed methods provided particularly rich insight into the mechanisms connecting determination and speed. For practitioners, the practical significance of determination cannot be overstated, given its demonstrable link with speed. Comparative work by Bamgbose and Alade (2022) across several states uncovered a consistent pattern linking determination with speed. Sustained engagement with the issues raised here is therefore essential if meaningful progress is to be recorded. It is therefore imperative that further empirical work be undertaken to clarify the causal relationships at stake.

Contemporary scholarship increasingly frames determination as inseparable from the broader question of speed. Federal and state governments have initiated several reforms, yet implementation gaps continue to constrain progress in matters of determination. Research by Bamgbose and Alade (2021) using mixed methods provided particularly rich insight into the mechanisms connecting determination and speed. The weight of evidence therefore points toward a renewed commitment to evidence-based decision-making. An examination by Adeniyi and Bakare (2019) attributed much of the observed variation in outcomes to institutional capacity and policy continuity. These observations collectively invite a reconsideration of standard assumptions regarding speed. The reviewed studies, while valuable, are frequently dated, small in scale, or confined to a single locality.

The relationship between determination and speed has been the subject of sustained academic interest across several disciplines. Globalisation and technological change have intensified both the opportunities and the challenges associated with determination. Alade and Adeniyi (2020), in a survey of relevant stakeholders, concluded that the benefits of determination are unevenly distributed across groups. For practitioners, the