# Effect of Academic Functional Learning Aptitude Test Strategies on the Academic Achievement of Learners with Autism Spectrum Disorder in Nigerian Inclusive Schools

**Bolanle Titilayo SEGILOLA**
**LCU/PG/002890**

**Being a PhD Thesis Submitted to the Department of Arts and Social Science Education, Faculty of Education, Lead City University, Ibadan, Oyo State, Nigeria**

**In Partial Fulfillment of the Requirements for the Award of (PhD) Doctor of Philosophy Degree in Measurement and Evaluation**

**2025**

Lead City University Ibadan DO NOT COPY

## Certification

This is to certify that Bolanle Titilayo Segilola with Matriculation Number LCU/PG/002890 carried out this research work titled "Effect of Academic Functional Learning Aptitude Test Strategies on the Academic Achievement of Learners with Autism Spectrum Disorder in Nigerian Inclusive Schools." in the Department of Arts and Social Science Education, Faculty of Education, Lead City University, Ibadan, Oyo State, for the award of (PhD) Doctor of Philosophy Degree in Measurement & Evaluation and that this has not been previously submitted.

---------- ----------

Associate Prof Ukamaka E. AKUCHE
(Supervisor)

Date

---------- ----------

Associate Prof Oluyomi PITAN
(Head of the Department)

Date

Lead City University Ibadan DO NOT COPY

## Dedication

This research work is dedicated to concerned parents who seek functional lifestyle for the child or children who lives with special learning conditions, through the inspiration of the Almighty God.

Lead City University Ibadan DO NOT COPY

**Acknowledgement**

I wish to express my gratitude, first and foremost to the inspirator of all knowledge – The Omni - God Almighty, who directed me to Lead City University, Ibadan, the domicile institution of this research work. I wish to further show my gratitude to the inclusive schools where this study was conducted, which are: Lead City Junior & Middle School, Ibadan, South-West; Maria De Plair Schools, Enugu, South-East; Christie Toby Schools, Portharcourt, South-South; Zamarr Education Institute, Abuja, Federal Capital Territory and Otana Integrated School, Jos Plateau North-Central, all institutions cited in Nigeria, West Africa. Gratitude is expressed to the families who hosted me during my field trip to their states. My gratitude goes to my cohort team of SEN-D practitioners, which comprise of clinical & education psychologists, occupational therapists, speech pathologist, physiotherapists and facilitators in Lagos State where this study was first initiated, and to the research assistants in all regions in Nigeria where this study was conducted. I wish to express my gratitude to Dr Adedeji Ademefun of Peterrocks International, FCT Abuja, Adewunmi Akinhanmi of Kingscourt Resources, The President, Educators, Medical, Legal and Child Protection Practitioners in JOSBHOSA, Gariki Specialist Hospital (Neurodevelopment Clinic), ADABS Law firm, Prof. Simeon Bignell & his team at the University of Derby, United Kingdom; The Editor & team of Autism Parenting Magazine, London United Kingdom; Autism Speaks Washington DC United States; National Autistic Society, United Kingdom and Directorate of Education Resources United Kingdom. I extend my gratitude to the president and executive members of Daughters of Zion Cooperative Society for their willingness and financial back up any time I call on the institution – Thank you.

Lead City University Ibadan DO NOT COPY

This phase of my gratitude goes to my supervisor – Associate Prof Ukamaka E. Akuche, Prof Philias O. Yara for your supportive and consistent reassuring prompt feedbacks, anytime I call – Thank you, Sir!. Prof Senimetu E. Ileuma and the incumbent HOD-Associate Prof Oluyomi Pitan, for your constant encouragement. To all my lecturers; Prof Babatunde A. Adeyemi and Associate Prof Monilola D. Oyetade – Thank you. To my ever-ready-to-support lecturers; Dr Sabina N. Obi, Dr Olabisi T. P Killan, Dr Ebo, Dr Omobla Gambo and Dr A. Ayodele Olaniyi – I appreciate you. I cannot forget the constructive inputs of Prof Modupe M. Osokoya and Dr Kehinde Lateef – my examiners – Thank you. Also, I cannot forget the measure of proactiveness shown by Mrs Adebayo former PRO of Postgraduate School, Prof Donald A. Odeleye-The Dean of the Faculty of Education and Prof Afolakemi Oredein-The Provost of Postgraduate School, when I approached you, with my request and intention to conduct this study in Lead City University, my gratitude is expressed. I extend my gratitude to the Library staff, and all the administrative staff of Postgraduate school, Faculty of Education and to Lead City University.

Finally, my unwary gratitude goes to my family; my husband – Olayinka M. Segilola (Engr.), my children–Mololuwa and Oluwatojumi Segilola, my father – S. Olatunde Idowu, my Sister, Olatokunbo A. Daniel and my mother, who would have loved to witness this moment but left us too soon – Late (Mrs.) Oluwakemi B. Idowu.

“Even though the above-mentioned institutions and persons have assisted in the process of this research work, I alone stand with the responsibility, and should be referred to, for any concerns that may be raised, if any may be found in this work.”

Lead City University Ibadan DO NOT COPY

## Abstract

The Joint National Association of Persons with Disabilities (JONAPWD) in Nigeria categorises learners with Autism Spectrum Disorder (ASD) under intellectually challenged group in both the constitution and the Inclusive Education Policy. This classification limits the exploration of academic achievement among ASD learners in Nigerian inclusive schools. To address this gap, the Academic Functional Learning Aptitude Test (AFLAT) model was developed. AFLAT comprises three components: academic aptitude diagnostics battery, teaching-learning strategies, and a support learning plan. This study aims to examines the main and interaction effects of AFLAT strategies on the academic achievement of ASD learners in inclusive settings, considering moderators such as gender, location, and socioeconomic status (SES). The study applies the treatment of AFLAT strategies with consideration to three theoretical reviews of ASD's mind perception, functional cognition and Blooms taxonomy of learning to improve the academic achievement. Seven research objectives and hypotheses were formulated and tested at a 0.05 level of significance. A quasi-experimental design was employed to assess the impact of AFLAT strategies (independent variable) on academic achievement (dependent variable), incorporating moderating variables. A sample of 60 ASD learners was selected from a population of 954 across four Nigerian regions and five states using a multi-stage sampling technique. Instruments used for data collection include the AFLAT's Specified Achievement Test (SAT-Guided) in selected subjects, and the Academic Aptitude Assessment Report (AAA-R), which provides aptitude ratings for academic performance. Instruments were subjected to face and content validity, and inter-rater reliability yielded a coefficient of 0.781, indicating good consistency. Data were analysed using descriptive statistics (frequency and percentage) and inferential statistics (Analysis of Covariance). Results showed significant main effects of AFLAT strategies on academic achievement ($F(1,57)=19.812$, $p<0.05$, $\eta^2=0.258$), and a significant effect based on residential location, particularly among urban participants ($F(1,57)=5.714$, $p<0.05$, $\eta^2=0.091$). These findings led to the rejection of null hypotheses 1 and 3. Post hoc was further used to estimate the direction of marginal means of the covariates in a chart. However, null hypotheses 2 and 4 were accepted, indicating no significant main effects for gender, ($F(1,57)=0.910$, $p>0.05$, $\eta^2=0.016$) and main effect of socio-economic status (SES), ($F(2,56)=0.807$, $p>0.05$, $\eta^2=0.028$) on academic achievement of ASD learners. Also, no significant interactions between AFLAT strategies and the moderating variables in hypotheses 5 to 7. These include; gender, ($F(1,55)=0.249$, $p>0.05$, $\eta^2=0.005$), location of residence ($F(1,55)=0.824$, $p>0.05$, $\eta^2=0.015$), and SES, ($F(2,53)=0.260$, $p>0.05$, $\eta^2=0.010$). The estimated marginal means here differed only minimally across groups.

In conclusion, ASD learners in the treatment group showed immediate academic improvement, when compared to the control group. The study recommends that stakeholders in education, health, and social inclusion sectors should prioritise the learning of specially impaired learners considering academic and aptitude approaches based on AFLAT strategies to enhance learning outcomes in inclusive schools. This research contributes to the pedagogical structure of inclusive


Ladoke Akintola University Ibadan DO NOT COPY

education, highlighting AFLAT's potential to benefit not only ASD learners but also those with other impairments and neurotypical learners in the Nigerian inclusive schools.

**Keywords:** **Academic Functional Learning, Aptitude Test, Autism Spectrum Disorder, Academic Achievement.**

**Word Count: 500**

Lead City University Ibadan DO NOT COPY

## Table of Contents

| Title | Page |
|---|---|
| Certification | ii |
| Dedication | iii |
| Acknowledgement | iv |
| Abstract | vi |
| Table of Content | vii |
| List of Tables | xi |
| List of Figures | xiv |
| List of Acronyms | xvi |
| **Chapter One: Introduction** | |
| 1.1 Background to the Study | 1 |
| 1.2 Statement of Problems | 9 |
| 1.3 Aims and Objectives of the Study | 10 |

1. 4 Hypotheses 11

1.6 Significance of the Study 12

1.7 Scope of the Study 13

1.8 Limitation of study 14

1.9 Operational Definition of Terms 16

**Endnotes** 18

**Chapter Two: Literature Review** **20**

**2.1 Conceptual Review** 21

2.1.1 Concept of Tests 21

2.1.2 Psychological Test 25

2.1.3 Aptitude Test 33

2.1.4 Academic Achievement Test 37

2.1.5 Academic Functional Learning Aptitude Test-(AFLAT) 42

2.1.6 Special Education Needs & Disabilities (SEN-D) 48

2.1.7 National Policy on Inclusive Education in Nigeria 50

2.1.8 Autism Spectrum Disorder 56

2.1.9 Associated Cases of ASD 65

2.1.10 Diagnostic and Statistical Manual of Mental Disorder – V (DSM-5) 70

**2.2 Theoretical Framework** **74**

2.2.1 Gestalt Learning Theory of the Mind Perception 74

2.2.2 Cognitive Functional Connectivity Theories for ASD 81

2.2.3 Advance Taxonomy of Blooms Learning Theory 90

Lead City University Ibadan DO NOT COPY

**2.3 Empirical Review** **99**

2.3.1 Academic Learning Strategies for ASD Learners 99

2.3.2 AFLAT Strategies and Teachers Effectiveness with ASD Academic Achievement 102

2.3.3 AFLAT Strategies and Affected Variables 106

**2.4 Conceptual Model** **109**

2.4.1 The Conceptual Model of AFLAT 109

2.5 Summary in Gap of Reviewed Literature 111

**Endnote** **113**

**Chapter Three: Methodology** **121**

3.1 Research Design 121

3.2 Population of study 121

3.3 Sample and Sampling Technique 124

3.4 Description of the Research Instruments 124

3.5 Validity of Research Instruments 129

3.6 Reliability of Research Instruments 130

3.7 Data Collection 132

3.8 Data Analysis 135

3.9 Ethical Approval 136

**Endnotes** **137**

**Chapter Four: Results And Discussion Of Findings** **138**

Lead City University Ibadan DO NOT COPY

4.1 Demographic Data Analysis 138

4.2 Presentation of Data 140

4.2.1 Hypotheses 140

4.3 Discussion of Findings 153

**Endnotes** **162**

**Chapter Five: Conclusion** **164**

5.1 Summary of Findings 164

5.2 Conclusion 168

5.3 Recommendations 171

5.4 Contribution to Knowledge 173

5.5 Suggested Areas for Further Research 175

Bibliography 176

Appendices 189

Biodata of Researcher 213

Research Photo View 216

University Compliance Certification 222

Turnitin 223

Lead City University Ibadan DO NOT COPY

## List of Tables


| Table | Title | Page |
|---|---|---|
| 2.2a | Cognitive Theory in Autism Spectrum Disorder | 82 |
| 2.2b | The Summary of Harrow's Taxonomy of Psychomotor Instructional Domain | 94 |
| 3.2a | Population Target for Intellectual Disability Learners | 122 |
| 3.2b | Population Target for School and Family | 124 |
| 3.3a: | Samples for ASD Learners, School Teachers and Family | 126 |
| 3.4a | Template for Individualised Table of Specification for Learners with Differences | 128 |
| 3.5 | Paired Sample Correlation for Pilot Test Validity | 130 |
| 3.6a | Reliability Statistics of AFLAT Instrument's Stability from Pilot Study | 131 |
| 3.6b: | Reliability of AFLAT Instrument's Goodness of Fit Test from Pilot Study | 131 |


Lead City University Ibadan DO NOT COPY

| | | |
|---|---|---|
| 4.1a | Distribution of the Participants by Gender | 138 |
| 4.1b | Distribution of the Participants by Geographical Location | 138 |
| 4.1c | Distribution of the Participants by Location of Residence | 139 |
| 4.1d | Distribution of the Participants by Socio-economic Status | 139 |
| 4.1e | Distribution of the Participants by Treatment Groups | 140 |
| 4.2.1a | Analysis of Covariance of Main Effect of AFLAT Strategies on Academic Achievement of Learners with Autism Spectrum Disorder | 140 |
| 4.2.1b | Estimated Marginal Means of AFLAT Strategies on Academic Achievement of Learners with Autism Spectrum Disorder | 141 |
| 4.2.1c | Analysis of Covariance of Main Effect of Gender on Academic Achievement Learners with Autism Spectrum Disorder | 143 |
| 4.2.1d | Estimated Marginal Means of Gender on Academic Achievement of Learners with Autism Spectrum Disorder | 143 |
| 4.2.1e | Analysis of Covariance of Main Effect of Location of Residence on Academic Achievement of Learners with Autism Spectrum Disorder | 144 |
| 4.2.1f | Estimated Marginal Means of Location of Residence on Academic Achievement of Learners with Autism Spectrum Disorder | 144 |
| 4.2.1g | Analysis of Covariance of Main Effect of Socio-economic Status on Academic Achievement of Learners with Autism Spectrum Disorder | 146 |
| 4.2.1h | Estimated Marginal Means of Socio-economic Status on Academic Achievement of Learners with Autism Spectrum Disorder | 146 |
| 4.2.1i | Analysis of Covariance of Interaction Effect of AFLAT Strategies and Gender on Academic Achievement of Learners with Autism Spectrum | |


Lead City University Ibadan DO NOT COPY

Disorder 147

4.2.1j Estimated Marginal Means of AFLAT Strategies and Gender on Academic Achievement of Learners with Autism Spectrum Disorder 148

4.2.1k Analysis of Covariance of Interaction Effect of AFLAT Strategies and Location of Residence on Academic Achievement of Learners with Autism Spectrum Disorder 149

4.2.1l Estimated Marginal Means of AFLAT Strategies and Location of Residence on Academic Achievement of Learners with Autism Spectrum Disorder 150

4.2.1m Analysis of Covariance of Interaction Effect of AFLAT Strategies and Socio-economic Status on Academic Achievement of Learners with Autism Spectrum Disorder 151

4.2.1n Estimated Marginal Means of AFLAT Strategies and Socio-economic Status on Academic Achievement of Learners with Autism Spectrum Disorder 152

Lead City University Ibadan DO NOT COPY

## List of Figures


| Figures | Title | Page |
|---|---|---|
| 2.1a | A Typical Array of the Spectrum for ASD | 59 |
| 2.1b | Paediatrics Developmental Screening Flowchart | 68 |
| 2.2a | Model of Information Processing Path | 80 |
| 2.2b | Cognitive Learning Loop | 83 |
| 2.2c | The link of the Cognitive Learning Theory Principles and Strategies | 87 |
| 2.2d | The Brain Network in the Connectivity Theory | 89 |
| 2.2e | Showing overly connected brain regions involved in sensory processing, emotion and motivation – which are tightly sychronised in children with autism – (right) than in adult in the (left) | 90 |
| 2.2f | Krathwohl's perspective of the taxonomy of affective domains of instructional activities | 92 |
| 2.2g | Anita Harrow's Taxonomy of Psychomotor Instructional Domain | 95 |
| 2.2h | Revised Bloom's Taxonomy of cognitive perspective | 96 |
| 2.2i | Taxonomy of Teaching-Learning and Assessment | |


Lead City University Ibadan DO NOT COPY

| | | |
|---|---|---|
| | revised Blooms Taxonomy (2019) | 98 |
| 2.4.1 | Conceptual Modal of AFLAT | 109 |
| 4.1 | Chart Showing of Estimated Marginal Means of Treatment and Control Group | 142 |
| 4.2: | Chart Showing of Estimated Marginal Means of Location of Residence | 145 |


**List of Acronyms**

| **Abbreviation** | **Meaning** |
|---|---|
| ADHD | Attention Deficit Hyperactivity Disorder |
| ADI-R | Autism Diagnosis Interview-Reviewed |
| ADOS-G | Autism Diagnostics Observation Schedule-Generic |
| AFLAT | Academic Functional Learning Aptitude Test |
| ASD | Autism Spectrum Disorder |
| ASQ | Age and Stages Questionnaire |
| CARS | Childhood Autism Rating Scale |
| CHC | Cattell-Horm-Carroll |
| CSBS | Communication and Symbolic Behaviour Scale |
| DN-CAS | Das-Naglieri Cognitive Assessment System |
| DSM-5 | Diagnostic and Statistical Manual of Mental Disorder – 5 |
| GARS | Gilliam Autism Rating Scale -Second Edition |
| IPU | Information Processing Unit |

Lead City University Ibadan DO NOT COPY

| | |
|---|---|
| MCHAT | Modified Checcklist for Autism Toddlers |
| MMPI | Minnesota Multiphasic Personality Inventory |
| NPIE | National Policy on Inclusive Education |
| PASS | Planning, Attention-Arousal, Simultaneous and Successive Cognitive Processes |
| PEDS | Parents' Evaluation of Developmental Status |
| SDG-4 | Sustainable Development Goal-4 |
| SEN-D | Special Education Needs & Disabilities |
| STAT-YC | Screening Tool for Tool for Toddlers and Young Children |
| TAT | Thematic Apperception Unit |
| ToM | Theory of the Mind |
| WAIS-R | Wechsler Adult Intelligence Scale-Revised |
| WJ-3R | Woodcock-Johnson 3-Revision |

Lead City University Ibadan DO NOT COPY