

Enhancing Mathematics Learning for Dyslexic Pupils: The Role of Primary School Mathematics Teachers in Early Identification and Instructional Intervention in Kogi State.

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DOI: <https://doi.org/10.51583/IJLTEMAS.2026.150700006>

Received: 23 June 2026; Accepted: 28 July 2026; Published: 05 August 2026

ABSTRACT

This study investigated the role of primary school mathematics teachers in enhancing mathematics learning among pupils with dyslexia through early identification and instructional intervention in Kogi State, Nigeria. Specifically, the study examined teachers' awareness of dyslexia, early identification practices, instructional intervention strategies, and challenges encountered in supporting pupils with dyslexia. The study was anchored on Vygotsky's Social Constructivist Theory and Tomlinson's Differentiated Instruction Theory, which emphasize learner-centred instruction, scaffolding, and adapting teaching to learners' diverse needs. A descriptive survey research design was adopted. The target population comprised 2,884 public primary school mathematics teachers across the 21 Local Government Areas of Kogi State. Using the Krejcie and Morgan (1970) sample size table, 338 teachers were selected through multistage sampling, while 330 valid questionnaires were analysed. Data were collected using the Mathematics Teachers' Dyslexia Awareness and Instructional Intervention Questionnaire (MTDAIIQ), which yielded a Cronbach's Alpha reliability coefficient of 0.85. Mean and standard deviation answered the research questions, while Pearson Product Moment Correlation and the independent-samples t-test tested the hypotheses at the 0.05 level of significance. The findings revealed that teachers had moderate awareness of dyslexia and early identification practices but limited knowledge of its characteristics. They employed differentiated instructional strategies, although inadequate training, limited resources, and institutional support constrained effective practice. Significant relationships existed between early identification and instructional intervention and between teachers' challenges and instructional effectiveness, while no significant gender difference was found. The study implies that strengthening teachers' professional capacity, improving resource provision, and fully implementing inclusive education policies will enhance mathematics learning outcomes for pupils with dyslexia in Kogi State.

Keywords: Dyslexia, mathematics teachers, early identification, instructional intervention, inclusive education, Kogi State.

INTRODUCTION

It is widely accepted that education is an essential instrument for achieving social justice, developing human capital, advancing national development, and improving quality of life. While Obanya (2014) asserts that education provides people with the knowledge, skills, and values necessary for sustainable national development, the Federal Republic of Nigeria (2013, 2018) emphasizes education as a means of providing equal learning opportunities through quality and inclusive education for all learners. Mathematics plays a significant role in the primary school curriculum because it develops the logical reasoning, critical thinking, and problem-solving skills necessary for lifelong learning and future success in science and technology (Van de Walle et al., 2019; NERDC, 2022; NCTM, 2023). Despite its significance, many pupils have difficulty studying, particularly those with dyslexia, which makes it difficult for them to understand language, mathematical symbols, and numerical concepts. Nigerian scholars like Obani (2006) and Abosi (2007) emphasized the significance of early identification and proper instructional support in order for pupils with special educational needs to realize their full academic potential. Similarly, Adebisi et al. (2015) highlighted the importance of effective teaching methods

and teacher competency in supporting pupils with disabilities. Additional global research demonstrates that dyslexia is a neurodevelopmental disorder that significantly affects learning if untreated (Shaywitz, 2020; Snowling et al., 2020). Thus, improving mathematics learning outcomes requires early detection, teacher preparedness, and appropriate instructional interventions. and promoting inclusive education, according to UNESCO (2020) and the American Psychiatric Association (2022).

Dyslexia is widely recognized as a neurodevelopmental learning disorder characterized by persistent difficulties with precise and fluent word identification, spelling, decoding, and language processing, despite having adequate IQ and educational opportunities (Shaywitz, 2020). Research suggests that dyslexia may affect learning mathematics even though it is primarily associated with difficulties with reading. Deciphering mathematical symbols, understanding written instructions, solving word problems, memorizing mathematical concepts, and organizing numerical data are all common challenges faced by dyslexic pupils. Therefore, these pupils may perform worse in mathematics than their peers if appropriate instructional help is not provided.

Globally, inclusive education is gaining more attention in order to give all children equal learning chances, regardless of their learning capacity or disability. Instead of just integrating pupils with disabilities into regular classrooms, inclusive education, according to UNESCO (2020), focuses on creating learning environments that effectively fulfill pupils' diverse educational needs. mathematics teachers are expected to modify teaching strategies, modify learning resources, and employ evidence-based interventions to help pupils with dyslexia engage in meaningful mathematics sessions.

Research has repeatedly demonstrated that early detection is one of the best methods to reduce the long-term educational effects of dyslexia. Children with learning difficulties who receive early identification and adequate instructional support perform significantly better academically than those who do not, according to Snowling and Hulme's (2021) research. Early detection allows teachers to implement timely interventions before pupils experience long-term academic failure, low self-esteem, and negative attitudes toward learning. When dyslexia is identified early in mathematics classes, teachers can adjust their methods, make mathematical terms more understandable, employ visual aids, and provide specialized help that enhances conceptual comprehension.

Despite the growing amount of global study on the topic, evidence from Nigeria indicates that many classroom teachers are ignorant of learning issues and sometimes confuse dyslexia for low academic performance, apathy, or lack of passion. According to Adebisi, Liman, and Longpoe (2015), even if inclusive education policies have improved educational access for pupils with disabilities, many teachers still lack the professional competence required to identify and properly instruct pupils with dyslexia. In a similar vein, Abosi (2007) observed that one of the biggest obstacles to the effective implementation of inclusive education in Nigerian schools is still insufficient teacher preparation.

In light of this, this study examined how primary school mathematics teachers in Kogi State could improve dyslexic pupils' mathematics learning through early detection and instructional intervention. The study specifically looked at instructors' knowledge of dyslexia, their methods for early detection, instructional intervention techniques, and the difficulties they face while helping pupils with dyslexia. The findings are expected to contribute to the growing body of literature on inclusive mathematics education in Nigeria by providing empirical evidence to support teacher education programmes, strengthen classroom instructional practices, and guide educational policymakers in promoting equitable learning opportunities for all pupils.

Statement of the Problem

In mathematics classes, dyslexic pupils often have trouble understanding mathematical language, comprehending symbols, following sequential methods, and solving word problems. This can lead to poor academic performance and low self-confidence (Obani, 2006; Abosi, 2007; Shaywitz, 2020). If these pupils are not detected early and given the appropriate instructional support, they are more likely to have persistent learning difficulties, low motivation, and poor arithmetic ability (Snowling et al., 2020; American Psychiatric Association, 2022). Because of this, a mathematics teacher's duties extend beyond merely teaching; they also involve early identification of learning difficulties, differentiated instruction, continuous assessment,

collaboration with parents and specialists, and the use of multimodal teaching strategies to meet a variety of learning needs. (Adebisi et al., 2015; Federal Republic of Nigeria, 2018). While Westwood (2018) and Tomlinson (2017) contended that differentiated instruction and suitable classroom accommodations greatly improve learning outcomes for pupils with learning disabilities, Florian (2021) highlighted that effective inclusive teaching depends on teachers' capacity to create learning experiences that enable every learner to participate successfully.

Many of the more general issues with inclusive education in Nigeria are reflected in Kogi State. Effective inclusion of pupils with special educational needs is still hampered by inadequate teacher preparation, a lack of instructional resources, and a lack of institutional support, despite the state's efforts to increase access to primary education through the Kogi State Universal Basic Education Board (KGSUBEB) and the Universal Basic Education program (Federal Republic of Nigeria, 2018; Universal Basic Education Commission [UBEC], 2023). According to recent research conducted in Nigeria, many instructors still struggle to implement inclusive practices due to a lack of professional training and a lack of understanding of pupils with special educational needs (Muraina & Oladele, 2023; Bouwoye & Adesokan, 2024; Nwosu et al., 2025). Similarly, Nnubia et al. (2024) showed that suitable instructional interventions can greatly enhance learning results for dyslexic Nigerian pupils, emphasizing the need of teacher competency and evidence-based classroom methods. Despite these advancements, there is still a dearth of empirical research on Kogi State's mathematics instructors' readiness to recognize and assist pupils with dyslexia, which leaves a knowledge gap that affects teacher professional development and educational policy. Kogi State mathematics teachers' ignorance of dyslexia prevented arithmetic-challenged elementary school pupils from receiving the support they needed. These pupils face the risk of being misunderstood, disregarded, or misdiagnosed. Teachers may not be able to identify early signs of dyslexia or possess the pedagogical abilities necessary to support pupils with the disorder. Without assistance, dyslexic pupils are likely to continue doing poorly in mathematics, which can negatively affect their motivation, sense of value, and long-term academic achievement.

Objective of the Study

The main objective of this study is to explore how primary school mathematics teachers in Kogi State contribute to the early identification of pupils with dyslexia and implement instructional interventions that enhance mathematics learning outcomes.

The specific objectives are stated below:

- I. To assess the level of dyslexia awareness among mathematics teachers in primary schools in Kogi,
- II. To examine the early identification practices employed by mathematics teachers for pupils with dyslexia in public primary schools in Kogi State.
- III. To investigate the instructional intervention strategies employed by mathematics teachers to support pupils with dyslexia in public primary schools in Kogi State.
- IV. To identify the challenges encountered by mathematics teachers in implementing instructional interventions for pupils with dyslexia in public primary schools in Kogi State.

Research Questions

- I. What is the level of mathematics teachers' awareness of dyslexia in public primary schools in Kogi State?
- II. What are the early identification practices employed by mathematics teachers for pupils with dyslexia in public primary schools in Kogi State?
- III. What instructional intervention strategies are employed by mathematics teachers to enhance mathematics learning among pupils with dyslexia in public primary schools in Kogi State?

- IV. What challenges do mathematics teachers encounter in implementing instructional interventions for pupils with dyslexia in public primary schools in Kogi State?

Research Hypotheses

H₀₁: There is no significant relationship between the early identification practices of mathematics teachers and their instructional intervention strategies for pupils with dyslexia in public primary schools in Kogi State.

H₀₂: There is no significant relationship between the challenges encountered by mathematics teachers and the effectiveness of instructional intervention for pupils with dyslexia in public primary schools in Kogi State.

Significance of the Study

This study is important because it will help mathematics teachers better understand dyslexia and provide them with practical ways to help impacted pupils. It will also help school administrators improve inclusive education resources, teacher preparation programs, and policies. It will raise parents' awareness, promoting better home-school cooperation and early intervention for kids who struggle with learning. The results will also give policymakers proof to incorporate dyslexia-focused training into inclusive education frameworks and teacher preparation programs. Lastly, by addressing a research need on dyslexia help in mathematics in Kogi State primary schools, the study advances scholarly understanding and provides a basis for further research.

Scope of the Study

This study will focus on public and private primary schools in Kogi State. It will involve mathematics teachers who teach Basic 1–6. The study investigates their awareness of dyslexia, approaches to identifying dyslexic pupils, instructional intervention strategies, challenges, and perceptions of outcomes.

LITERATURE REVIEW

The reviewed literature established that dyslexia is a neurodevelopmental learning disorder that affects not only reading but also pupils' ability to understand mathematical language, symbols, sequencing, and problem-solving (Shaywitz, 2020; Snowling et al., 2020; American Psychiatric Association, 2022). While previous studies consistently acknowledged the importance of early identification and instructional support, most concentrated on explaining the characteristics of dyslexia rather than examining its implications for mathematics instruction. Nigerian scholars such as Obani (2006) and Abosi (2007) emphasized the educational needs of learners with disabilities generally but devoted limited attention to the specific role of mathematics teachers. Consequently, the conceptual literature provides a useful foundation for understanding dyslexia but offers limited evidence on how mathematics teachers can improve learning outcomes for pupils with dyslexia within inclusive primary school classrooms.

The theoretical literature demonstrated that Vygotsky's Social Constructivist Theory, Gardner's Multiple Intelligences Theory, and Tomlinson's Differentiated Instruction Theory collectively explain the importance of learner-centred instruction in inclusive mathematics education. While Vygotsky emphasizes scaffolding and guided learning, Gardner recognizes individual learning differences, and Tomlinson advocates differentiated instructional practices. Although these theories provide complementary explanations for supporting learners with dyslexia, most previous studies have applied them independently rather than integrating them to explain the combined influence of teacher awareness, early identification, and instructional intervention on mathematics learning. The present study therefore integrates these complementary perspectives to provide a broader explanation of inclusive mathematics teaching.

The empirical literature consistently reported that teachers' awareness of dyslexia influences their ability to identify pupils with learning difficulties and provide appropriate instructional support (Adebisi et al., 2015; Muraina & Oladele, 2023; Nwosu et al., 2025). However, many previous Nigerian studies focused on teacher preparedness for inclusive education generally without examining mathematics teachers specifically. Similarly,

international studies by Florian (2021), Westwood (2018), and Shaywitz (2020) demonstrated the effectiveness of differentiated instruction and early intervention but were conducted in educational systems with greater institutional support than is available in many Nigerian public schools. Consequently, their findings cannot be transferred directly to the Nigerian context without considering differences in teacher preparation, classroom conditions, and educational resources.

Similarly, studies on instructional intervention consistently identified differentiated instruction, multisensory teaching, visual learning materials, peer-assisted learning, and continuous assessment as effective strategies for improving learning outcomes among pupils with dyslexia (Tomlinson, 2017; Westwood, 2018; Florian, 2021). Nevertheless, relatively few Nigerian studies have examined whether mathematics teachers possess the knowledge and institutional support required to implement these strategies effectively. Most existing studies emphasized reading disabilities or inclusive education broadly, leaving limited evidence regarding mathematics instruction for pupils with dyslexia. This suggests that improving teacher competence alone may not be sufficient without corresponding improvements in school resources, specialist support, and policy implementation.

The literature also revealed that inadequate professional training, overcrowded classrooms, limited instructional materials, insufficient specialist personnel, and weak institutional support continue to hinder effective implementation of inclusive education in Nigeria (Federal Republic of Nigeria, 2018; UBEC, 2023). While previous studies have identified these challenges, few have investigated how they directly influence the instructional practices of mathematics teachers working with pupils with dyslexia. Consequently, the interaction between teachers' awareness, early identification practices, instructional intervention, and institutional constraints remains insufficiently understood within Nigerian primary schools.

A critical examination of the reviewed studies further indicates that most previous researchers investigated individual aspects of inclusive education separately. Few studies simultaneously examined teachers' awareness of dyslexia, early identification practices, instructional intervention strategies, and implementation challenges within a single investigation. This fragmented approach limits a comprehensive understanding of how these variables interact to influence mathematics learning among pupils with dyslexia. The present study addresses this limitation by integrating these variables into one analytical framework.

Overall, the literature reveals a clear research gap. Although studies have examined dyslexia, inclusive education, and teacher preparedness, limited empirical evidence exists on the role of primary school mathematics teachers in enhancing mathematics learning among pupils with dyslexia, particularly in Kogi State. By simultaneously investigating teachers' awareness, early identification practices, instructional intervention strategies, and implementation challenges, this study contributes context-specific evidence to the literature. The findings also provide practical guidance for teacher education institutions, policymakers, and school administrators seeking to strengthen inclusive mathematics education in Nigeria.

METHOD

In order to better understand how primary school mathematics teachers in Kogi State, Nigeria, might help pupils with dyslexia learn mathematics through early detection and instructional intervention, this study used a survey research approach. The Kogi State Universal Basic Education Board (KGSUBEB) oversees primary education in the state's 21 Local Government Areas, where the survey was carried out. In order to guarantee sufficient representation throughout the three senatorial districts, a sample of 338 teachers was chosen using a multistage sampling technique and the Krejcie and Morgan (1970) sample size determination table. The target population consisted of 2,884 public primary school mathematics teachers. The Mathematics Teachers' Dyslexia Awareness and Instructional Intervention Questionnaire (MTDAIIQ), a tool created by the researcher, was used to gather data, which consisted of demographic items and 32 structured statements measuring teachers' awareness, early identification practices, instructional intervention strategies, and challenges encountered.

To guarantee the instrument's content and face validity, specialists in measurement and evaluation, special education, and mathematics education evaluated it. The instrument's reliability was determined via a pilot

research with thirty mathematics teachers, which produced an overall Cronbach's Alpha coefficient of 0.85, showing strong internal consistency. Before distributing the questionnaires, ethical approval and authorization were acquired from the appropriate educational authorities. 330 of the 338 surveys that were sent out were correctly filled out and returned, yielding a 97.6% response rate. To address the study questions, descriptive statistics (frequency, percentage, mean, and standard deviation) were employed in the analysis of the gathered data using SPSS version 27. The Pearson Product Moment Correlation (PPMC) was employed to test Hypotheses One and Two because both hypotheses sought to determine the relationship between two study variables. Specifically, Hypothesis One examined the relationship between mathematics teachers' early identification practices and their instructional intervention strategies for pupils with dyslexia, while Hypothesis Two examined the relationship between the challenges encountered by mathematics teachers and the effectiveness of instructional intervention. Pearson Product Moment Correlation is appropriate because it measures the strength and direction of the linear relationship between two variables measured using composite mean scores derived from the questionnaire. The technique indicates whether the relationship is positive or negative and whether it is statistically significant, thereby making it suitable for testing hypotheses that investigate associations rather than differences between variables.

RESULTS

Research Question One: What is the level of mathematics teachers' awareness of dyslexia in public primary schools in Kogi State?

Table 10.1: Mathematics Teachers' Awareness of Dyslexia

S/N	Questionnaire Items	Mean	SD	Decision
1	I understand the meaning of dyslexia.	2.34	0.88	Disagree
2	I can identify common characteristics of pupils with dyslexia.	2.08	0.90	Disagree
3	Dyslexia affects pupils' mathematics learning.	3.36	0.60	Agree
4	Pupils with dyslexia experience difficulty solving mathematical word problems.	3.48	0.65	Agree
5	Poor mathematics performance may indicate a learning disability rather than laziness.	3.26	0.71	Agree
6	Teachers should receive regular training on dyslexia.	3.72	0.51	Agree
7	I understand how dyslexia affects classroom learning.	3.21	0.74	Agree
8	I know when to refer a pupil for professional assessment.	2.97	0.82	Agree
	Grand Mean	3.05	0.73	Agree

With a grand mean of 3.05 (SD = 0.73), which is higher than the criterion mean of 2.50, Table 10.1 shows that Kogi State primary school mathematics instructors have a moderate awareness of dyslexia. Respondents concurred that dyslexia hinders the acquisition of arithmetic, makes word problem solving challenging, and necessitates ongoing dyslexia training for teachers. They disagreed, meanwhile, that they could recognize the common traits of dyslexia or comprehend its definition. This implies that while educators are aware of how dyslexia affects pupils' performance in mathematics, many may not have the skills necessary to recognize it early enough. The results corroborate those of Adebisi et al. (2015) and Muraina and Oladele (2023), who noted that teachers were not adequately educated to diagnose learning difficulties. Therefore, achieving the first objective of the study requires continuous professional development to enhance teachers' awareness and identification skills.

Research Question Two: What early identification practices are employed by mathematics teachers for pupils with dyslexia in public primary schools in Kogi State?

Table 10.2: Early Identification Practices Employed by Mathematics Teachers (N = 330)

S/N	Questionnaire Items	Mean	SD	Decision
9	I observe pupils carefully during mathematics lessons to identify learning difficulties.	3.36	0.64	Agree
10	I can recognize the early signs of dyslexia among pupils.	2.24	0.81	Disagree
11	I assess pupils individually when persistent learning difficulties are observed.	3.28	0.68	Agree
12	I keep records of pupils showing signs of learning difficulties.	2.21	0.77	Disagree
13	I communicate with parents regarding suspected cases of dyslexia.	2.31	0.70	Disagree
14	Early identification improves pupils' mathematics achievement.	3.63	0.55	Agree
15	Teachers should collaborate with specialists in identifying dyslexia.	3.58	0.58	Agree
16	Schools should conduct regular screening for learning disabilities.	3.69	0.51	Agree
	Grand Mean	3.00	0.66	Agree

With a grand mean of 3.00 (SD = 0.66), Table 10.2 shows that Kogi State primary school mathematics instructors exhibited a modest level of early identification procedures. Respondents acknowledged that early detection, working with experts, and routine screening enhance learning outcomes. They also acknowledged that they watch pupils during mathematics classes and evaluate those who have ongoing learning challenges. They disagreed, meanwhile, that they could identify the early indicators of dyslexia, keep track of impacted pupils, or notify parents of probable cases. These results imply that while educators recognize the value of early detection, they do not possess the practical abilities necessary for successful execution. This supports Adebisi et al. (2015) and Nwosu et al. (2025), who reported inadequate teacher preparation for identifying learners with special educational needs. Therefore, achieving the second objective requires continuous training and stronger school-home collaboration.

Research Question Three: What instructional intervention strategies are employed by mathematics teachers to enhance mathematics learning among pupils with dyslexia?

Table 10.3: Instructional Intervention Strategies Employed by Mathematics Teachers

S/N	Questionnaire Items	Mean	SD	Decision
17	I use visual teaching materials during mathematics lessons.	3.48	0.63	Agree
18	I simplify mathematical instructions for struggling pupils.	3.56	0.59	Agree
19	I use concrete objects and manipulatives during instruction.	3.41	0.67	Agree
20	I provide additional practice for pupils experiencing learning difficulties.	3.50	0.62	Agree
21	I encourage peer learning during mathematics lessons.	3.36	0.71	Agree
22	I use continuous assessment to monitor pupils' progress.	3.46	0.65	Agree
23	I modify my teaching methods to accommodate pupils with dyslexia.	3.33	0.72	Agree
24	Instructional intervention improves mathematics learning among pupils with dyslexia.	3.74	0.49	Agree

	Grand Mean	3.48	0.64	Agree
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The grand mean of 3.48 (SD = 0.64) in Table 10.3 indicates that Kogi State primary school mathematics instructors used instructional intervention strategies extensively. In order to accommodate pupils with learning challenges, respondents concurred that they employed visual teaching materials, simplified mathematical instructions, tangible items and manipulatives, extra practice, peer learning, ongoing evaluation, and adapted teaching techniques. Additionally, they firmly agreed that instructional intervention enhances dyslexic pupils' understanding of mathematics (Mean = 3.74). These results imply that educators should identify and use inclusive teaching techniques that can improve pupils with dyslexia's engagement and academic achievement. The findings are consistent with Tomlinson (2017), Westwood (2018), and Florian (2021), who emphasized that differentiated instruction and inclusive teaching practices improve learning outcomes for pupils with diverse learning needs. Thus, the third objective of the study was achieved, indicating that mathematics teachers generally adopt appropriate instructional intervention strategies for supporting pupils with dyslexia.

Research Question Four: What challenges do mathematics teachers encounter in supporting pupils with dyslexia in public primary schools in Kogi State?

Table 10.4: Challenges Encountered by Mathematics Teachers

S/N	Questionnaire Items	Mean	SD	Decision
25	I have not received adequate training on dyslexia.	3.66	0.56	Agree
26	Large class sizes make it difficult to support pupils with dyslexia.	3.58	0.60	Agree
27	There are inadequate instructional materials for inclusive mathematics teaching.	3.51	0.65	Agree
28	My school lacks specialists who can assist pupils with dyslexia.	3.60	0.58	Agree
29	Time constraints limit individualized instruction.	3.47	0.67	Agree
30	Parents rarely provide adequate support for pupils with learning difficulties.	3.29	0.73	Agree
31	Government support for inclusive education is inadequate.	3.55	0.61	Agree
32	These challenges reduce the effectiveness of mathematics instruction.	3.63	0.55	Agree
	Grand Mean	3.54	0.62	Agree

The grand mean of 3.54 (SD = 0.62) in Table 10.4 shows that primary school mathematics instructors in Kogi State strongly agreed that a number of obstacles prevent successful mathematics education for pupils with dyslexia. According to the respondents, inclusive mathematics instruction is negatively impacted by a number of factors, including big class sizes, poor dyslexia training, a lack of specialists, time restrictions, a lack of parental support, and inadequate government funding. Additionally, they concurred that these difficulties lessen the efficacy of educational intervention (Mean = 3.63). These results imply that systemic and institutional constraints continue to restrict successful classroom practice, even in spite of teachers' commitment to assist pupils with dyslexia. The findings are consistent with Adebisi et al. (2015), Muraina and Oladele (2023), and Nwosu et al. (2025), who identified inadequate teacher preparation, poor resource provision, and weak institutional support as major constraints to inclusive education in Nigeria. Therefore, the fourth objective of the study was achieved, highlighting the need for improved teacher training, adequate funding, and stronger policy implementation to enhance inclusive mathematics education.

Test of Hypotheses

Hypothesis One (H_{01}): There is no significant relationship between the early identification practices of mathematics teachers and their instructional intervention strategies for pupils with dyslexia in public primary schools in Kogi State.

Variables	N	Mean	SD	r	p-value	Decision
Early Identification	330	3.00	0.66			
Instructional Intervention	330	3.48	0.64	0.612	0.001	Reject H_0

Table 10.5: Showing the Relationship between Early Identification and Instructional Intervention among Mathematics Teachers in Public Primary Schools in Kogi State

Significant at $\alpha = 0.05$

Early identification and instructional intervention among mathematics teachers in Kogi State's public primary schools are statistically significantly correlated ($r = 0.612$, $p = 0.001$), according to Table 10.5. The null hypothesis was rejected since the p-value (0.001) fell below the 0.05 level of significance. This suggests that the instructional intervention tactics used by mathematics teachers for dyslexic pupils are strongly correlated with early identification practices. According to the research, educators who successfully identify pupils with dyslexia are more likely to use effective teaching strategies to help them learn arithmetic. This result is in line with Florian's (2021) emphasis that prompt identification allows educators to design inclusive lessons that address the varied requirements of their pupils. It also agrees with Adebisi et al. (2015), who reported that teachers' ability to recognize learning difficulties contributes to the selection of appropriate instructional strategies for learners with special educational needs. The result underscores the importance of strengthening teachers' competence in early identification to improve instructional intervention and mathematics learning outcomes for pupils with dyslexia.

Hypothesis Two (H_{02}): There is no significant relationship between the challenges encountered by mathematics teachers and the effectiveness of instructional intervention for pupils with dyslexia in public primary schools in Kogi State.

Table 10.6: Showing the Relationship between the Challenges Encountered by Mathematics Teachers and the Effectiveness of Instructional Intervention for Pupils with Dyslexia in Public Primary Schools in Kogi State

Variables	N	Mean	SD	R	p-value	Decision
Challenges Encountered by Mathematics Teachers	330	3.54	0.62			
Effectiveness of Instructional Intervention	330	3.48	0.64	-0.486	0.003	Reject H_0

Significant at $\alpha = 0.05$

The Pearson Product Moment Correlation analysis of the link between the difficulties faced by mathematics teachers and the efficacy of instructional intervention for dyslexic pupils in Kogi State's public primary schools is shown in Table 10.6. The two variables had a moderately unfavorable and statistically significant connection, according to the results ($r = -0.486$, $p = 0.003$). The null hypothesis was rejected since the p-value (0.003) fell below the 0.05 level of significance. This suggests that the efficacy of instructional assistance for pupils with dyslexia declines as the difficulties faced by mathematics teachers rise. The finding agrees with Adebisi et al. (2015), Muraina and Oladele (2023), and Nwosu et al. (2025), who reported that inadequate teacher training, insufficient instructional materials, large class sizes, and weak institutional support hinder the effective implementation of inclusive education. The result suggests that reducing these challenges would improve instructional intervention and enhance mathematics learning outcomes for pupils with dyslexia.

DISCUSSION OF THE FINDING

The study investigated the role of primary school mathematics teachers in enhancing mathematics learning among pupils with dyslexia through early identification and instructional intervention in Kogi State. The findings revealed that mathematics teachers possessed a moderate level of awareness of dyslexia. Although respondents generally recognized that dyslexia affects mathematics learning and acknowledged the need for regular teacher training, many lacked adequate understanding of its characteristics and practical identification procedures. This finding suggests that teachers are aware of the educational consequences of dyslexia but have not received sufficient professional preparation to recognize and address the condition effectively in classroom practice. This finding extends the reports of Obani (2006), Abosi (2007), and Adebisi et al. (2015), who attributed teachers' limited competence largely to inadequate training in special and inclusive education. It also supports Muraina and Oladele (2023) and Nwosu et al. (2025), who observed that teacher preparedness remains a major challenge to inclusive education in Nigeria. The present study contributes to the literature by demonstrating that this challenge also exists among primary school mathematics teachers in Kogi State, highlighting the need for subject-specific professional development.

The study further found that teachers demonstrated moderate early identification practices. While many respondents reported observing pupils during mathematics lessons and recognized the importance of early identification, relatively few indicated that they could confidently recognize early signs of dyslexia, maintain systematic records, or collaborate effectively with parents and specialists. This finding implies that teachers appreciate the value of early identification but lack the practical skills and institutional support required for effective implementation. The result is consistent with Shaywitz (2020), Snowling et al. (2020), and Florian (2021), who emphasized that early identification is fundamental to successful intervention. However, the present study provides additional evidence that awareness alone does not guarantee effective identification; practical competence, collaboration, and structured school-based screening systems are equally important.

The findings also showed that mathematics teachers frequently employed instructional intervention strategies, including differentiated instruction, visual teaching aids, simplified instructions, concrete learning materials, peer learning, and continuous assessment. This demonstrates that teachers are making efforts to support pupils with learning difficulties despite limited formal training in dyslexia. The finding supports Tomlinson (2017), Westwood (2018), Florian (2021), and Nnubia et al. (2024), who recommended learner-centred and evidence-based instructional strategies for pupils with dyslexia. Nevertheless, the current study suggests that many of these practices may be based on teachers' general pedagogical experience rather than specialized knowledge of dyslexia. Consequently, professional development focused specifically on dyslexia could improve the effectiveness of these instructional strategies and enhance mathematics learning outcomes.

Another important finding was that mathematics teachers encounter substantial challenges in implementing effective instructional intervention. These challenges include inadequate professional training, overcrowded classrooms, insufficient instructional materials, lack of specialist support, limited parental involvement, time constraints, and weak government support for inclusive education. These findings indicate that successful inclusive mathematics education depends not only on teachers' commitment but also on the availability of institutional resources and supportive educational policies. The findings corroborate those of the Federal Republic of Nigeria (2018), UBEC (2023), Muraina and Oladele (2023), and Nwosu et al. (2025), who similarly identified systemic barriers to inclusive education. The present study further demonstrates that these constraints directly affect the implementation of instructional interventions by mathematics teachers in public primary schools in Kogi State.

The hypothesis tests revealed a significant relationship between early identification and instructional intervention, indicating that teachers who employ better early identification practices are more likely to implement effective instructional support for pupils with dyslexia. The study also found no significant difference between the instructional intervention strategies of male and female mathematics teachers, suggesting that

gender does not influence teachers' approaches to supporting pupils with dyslexia. Furthermore, a significant relationship was found between the challenges encountered by teachers and the effectiveness of instructional intervention, indicating that institutional and classroom constraints are closely associated with the successful implementation of inclusive instructional practices. These findings underscore the importance of strengthening teacher capacity, improving school resources, and enhancing institutional support to achieve effective inclusive mathematics education.

Practical Implications of the Findings

The findings have important implications for teacher education, educational policy, and classroom practice. For teacher education, they underscore the need to integrate dyslexia identification, inclusive pedagogy, and differentiated mathematics instruction into both pre-service and in-service training programmes. For educational policy, the findings support stronger implementation of Nigeria's National Policy on Inclusive Education through increased funding, provision of instructional resources, establishment of school-based screening systems, and deployment of specialist personnel. At the classroom level, mathematics teachers should adopt evidence-based strategies such as differentiated instruction, multisensory teaching, continuous assessment, and collaboration with parents and specialists to improve learning outcomes for pupils with dyslexia. Collectively, these measures will strengthen inclusive mathematics education and contribute to equitable access to quality basic education in Kogi State and Nigeria.

Contribution to Knowledge

This study contributes to knowledge by providing empirical evidence on the role of primary school mathematics teachers in enhancing mathematics learning among pupils with dyslexia in public primary schools in Kogi State, an area that has received limited scholarly attention. Unlike previous studies that focused broadly on inclusive education or learning disabilities, this study simultaneously examined teachers' awareness of dyslexia, early identification practices, instructional intervention strategies, and implementation challenges. The findings provide context-specific evidence that can guide teacher education institutions, policymakers, and school administrators in strengthening inclusive mathematics education. The study also extends the application of Vygotsky's Social Constructivist Theory, Gardner's Multiple Intelligences Theory, and Tomlinson's Differentiated Instruction Theory within the context of mathematics education for pupils with dyslexia in Nigeria, thereby enriching the existing body of literature on inclusive education.

Novelty of the Study

This study makes several important contributions to knowledge. First, unlike many previous studies that focused broadly on inclusive education or learning disabilities, it specifically investigated the role of primary school mathematics teachers in enhancing mathematics learning among pupils with dyslexia. Second, the study simultaneously examined teachers' awareness of dyslexia, early identification practices, instructional intervention strategies, and implementation challenges within a single empirical investigation. Third, it provides context-specific evidence from public primary schools in Kogi State, where empirical studies on dyslexia and mathematics instruction remain limited. Finally, the study integrates Vygotsky's Social Constructivist Theory, Gardner's Multiple Intelligences Theory, and Tomlinson's Differentiated Instruction Theory to explain how effective instructional practices can improve mathematics learning among pupils with dyslexia. These contributions provide valuable evidence for teacher education, educational policy, and inclusive classroom practice in Nigeria.

Strengths of the Study

This study possesses several strengths that enhance its credibility. It employed a relatively large sample of mathematics teachers drawn from all twenty-one Local Government Areas of Kogi State, thereby improving the representativeness of the findings. The study used a validated and reliable research instrument with a Cronbach's Alpha coefficient of 0.85, ensuring the consistency of the data collected. In addition, the alignment of the study's

objectives, research questions, hypotheses, and analytical procedures strengthened the validity of the findings. The adoption of established theoretical frameworks further provided a sound basis for interpreting the results and explaining the role of mathematics teachers in promoting inclusive education.

Limitations of the Study

Despite its contributions, the study has some limitations. The descriptive survey design relied exclusively on self-reported questionnaire responses, which may not fully reflect teachers' actual classroom practices. Consequently, the findings should be interpreted as perceptions rather than direct observations of instructional behaviour. The study was also limited to public primary schools in Kogi State, thereby restricting the generalizability of the findings to private schools or other states in Nigeria. Furthermore, the quantitative design did not permit an in-depth exploration of teachers' experiences, beliefs, and contextual challenges. Future studies employing qualitative or mixed-method approaches could provide richer insights into how mathematics teachers identify and support pupils with dyslexia in classroom settings.

CONCLUSION

This study examined the role of primary school mathematics teachers in enhancing mathematics learning among pupils with dyslexia through early identification and instructional intervention in Kogi State. The findings revealed that mathematics teachers possessed a moderate level of awareness of dyslexia and demonstrated moderate early identification practices, although many lacked sufficient knowledge of the characteristics of dyslexia and systematic identification procedures.

Teachers reported employing several learner-centred instructional strategies, including differentiated instruction, visual teaching aids, concrete learning materials, peer learning, and continuous assessment to support pupils with dyslexia. However, inadequate professional training, insufficient instructional materials, overcrowded classrooms, lack of specialist support, and weak institutional support continue to constrain effective implementation of inclusive mathematics instruction.

The study further established a significant relationship between early identification and instructional intervention, indicating that effective identification practices are associated with improved instructional support for pupils with dyslexia.

It also found no significant difference between the instructional intervention strategies of male and female mathematics teachers, while the challenges encountered by teachers were significantly related to the effectiveness of instructional intervention. These findings underscore the importance of strengthening teacher capacity, improving institutional support, and ensuring the effective implementation of inclusive education policies.

Overall, the study contributes empirical evidence to the growing literature on inclusive mathematics education and provides practical insights for improving learning outcomes among pupils with dyslexia in public primary schools in Kogi State.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations are made:

- I. KGSUBEB should organize regular training on dyslexia identification and inclusive mathematics instruction for primary school teachers.
- II. Teacher education institutions should strengthen the integration of dyslexia and inclusive education into pre-service and in-service teacher preparation programmes.
- III. Schools should establish effective screening, referral, and record-keeping systems for the early identification of pupils with dyslexia.

- IV. Government should provide adequate instructional materials, specialist personnel, and financial support for inclusive education programmes.
- V. School administrators should encourage collaboration among teachers, parents, and special education professionals to improve support for pupils with dyslexia.

REFERENCES

1. Abosi, C. O. (2007). Educating children with learning disabilities in Africa. *Learning Disabilities Research & Practice*, 22(3), 196–201.
2. Adebisi, R. O., Liman, N. A., & Longpoe, P. K. (2015). Using assistive technology in teaching children with learning disabilities in the 21st century. *Journal of Education and Practice*, 6(24), 14–20.
3. American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders* (5th ed., text rev.; DSM-5-TR). American Psychiatric Association Publishing.
4. Bouwoye, O., & Adesokan, A. (2024). Diversity of learners, their special learning needs and inclusive education: Perspectives of teachers in public secondary schools in Kwara State, Nigeria. *International Journal of Research and Innovation in Social Science*, 8(2), 1273–1287. <https://doi.org/10.47772/IJRIS.2024.802089>
5. Federal Republic of Nigeria. (2013). *National policy on education* (6th ed.). Nigerian Educational Research and Development Council.
6. Federal Republic of Nigeria. (2018). *National Policy on Inclusive Education in Nigeria*. Federal Ministry of Education.
7. Florian, L. (2021). *The Sage handbook of special education* (2nd ed.). Sage Publications.
8. Gardner, H. (2011). *Frames of mind: The theory of multiple intelligences* (Updated ed.). Basic Books.
9. Kogi State Universal Basic Education Board (KGSUBEB). (2024). *Annual School Census Report*. Lokoja, Nigeria.
10. Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30(3), 607–610. <https://doi.org/10.1177/001316447003000308>
11. Muraina, K. O., & Oladele, O. (2023). Education inclusiveness among children with learning disabilities in Nigeria: Implications for counselling psychology. *REAL Journal*, 8(1).
12. National Council of Teachers of Mathematics. (2023). *Principles to actions: Ensuring mathematical success for all*. National Council of Teachers of Mathematics.
13. Nigerian Educational Research and Development Council. (2022). *National curriculum for primary mathematics*. NERDC Press.
14. Nnubia, U. I., Okechukwu, F. O., Mefoh, P. C., Umennuihe, C. L., Nwauzoije, E. J., Ogba, K. T. U., Ogbonnaya, E. K., Aliche, C. J., Nwobi, C. A., Onyekachi, C. C., Okoli, D. N., Nnorodi, C. J., Epistle, E. C., Abang, S. M., & Obi, C. V. (2024). Effectiveness of picture concept activity on improving the cognitive proficiency skill and reading performance of Nigerian pupils with dyslexia. *Journal of Education*, 204(4), 703–718. <https://doi.org/10.1177/00220574231222937>
15. Nwazuoke, I. A. (2010). *Special education and inclusive education in Nigeria: Issues and challenges*. National Open University of Nigeria.
16. Nwosu, K. C., Letzel-Alt, V., & Pozas, M. (2025). From theory to practice: Exploring Nigerian student teachers' experiences of managing learners with special needs in inclusive classrooms. *British Journal of Special Education*, 52(4), 511–522. <https://doi.org/10.1111/1467-8578.70042>
17. Obani, T. C. (2006). *Teaching Pupils with Special Educational Needs in Regular Classrooms*. Book Builders.
18. Obanya, P. (2014). *Educationeering*. HEBN Publishers.
19. Shaywitz, S. E. (2020). *Overcoming dyslexia* (2nd ed.). Alfred A. Knopf.
20. Snowling, M. J., Hulme, C., & Nation, K. (2020). Defining and understanding dyslexia: Past, present and future. *Oxford Review of Education*, 46(4), 501–513.
21. Tomlinson, C. A. (2017). *How to differentiate instruction in academically diverse classrooms* (3rd ed.). ASCD.
22. UNESCO. (2020). *Global education monitoring report 2020: Inclusion and education: All means all*. UNESCO Publishing.

23. Universal Basic Education Commission (UBEC). (2023). National Personnel Audit Report. Abuja, Nigeria.
24. Van de Walle, J. A., Karp, K. S., & Bay-Williams, J. M. (2019). Elementary and middle school mathematics: Teaching developmentally (10th ed.). Pearson.
25. Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. Harvard University Press.
26. Westwood, P. (2018). What teachers need to know about learning difficulties (2nd ed.). ACER Press.