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Effect of Remediation of Mathematics Learning Difficulties on Upper Primary Schools Pupils in Kaduna State Nigeria

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ABSTRACT
The study investigates the effect of remediation of mathematics learning difficulties on upper basic primary school pupils in Kaduna State. Three research objectives, research questions and hypotheses each guided the study. Quasi experimental research design was employed on the upper primary schools' pupils with the three zones of in Kaduna State's primary schools. An intact class sample of two hundred and thirty (230) pupils were used from both rural and urban areas comprising of male and female pupils. The research questions and hypotheses were tested using descriptive statistics while the null hypotheses were analyzed using t-test at p ≤ 0.00 level of significance with the aid of SPSS 2.00 software version. The findings from the study revealed that, there is a significant difference in the pupils' academic performance in Kaduna state before and after remediation among the male and female pupils as well as in urban and rural areas. Thus, all three the null hypotheses were rejected. The study recommends that Remediation of mathematics learning difficulties among pupils at all level of primary education should be given serious attention. Government and other major stakeholders should also ensure that remediation is carried out regularly whenever low performance is observed among pupils at all level.

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INTRODUCTION

Learning mathematical concepts with proper understanding and the ability to apply its concepts in solving everyday problem is the aim of teaching mathematics at all levels of education including primary schools. This assertion is in line with the recommendations of the National Council of Teachers of Mathematics (NCTM, 2019). However, the poor performance in mathematics especially at the primary level has been a matter of great concern to pupils, parents, teachers, mathematics educators and the society in this age of technological advancement (Lodam, 2012). It is indisputable fact that, while few pupils learn mathematical concepts with considerable prosperity, significant number find learning mathematics quite difficult, this therefore constitutes a major source of concern to mathematics teachers and mathematics educators (Odili, 2006) and of course poses a threat for sustainable development in Nigeria.

Quiet Over the years, the causes of learning difficulties among children have been identified by psychologists and mathematics educators. For example, Jordan and Laurie (2009) maintained that, injury to certain parts of the brain is among the factors that can cause inability to perform calculations. On the other hand, Yusha'u (2004) believes that, among the factors that cause difficulties in learning mathematics include psychological, social, emotional, intellectual and pedagogical factors. This assertion is in conformity with what Fletcher (2007) highlighted as the factors that cause mathematics learning difficulty among pupils.

Difficulties experienced in the teaching and learning of mathematics in primary schools as confirmed by the strengthening mathematics and science education (SMASE) Baseline Survey

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(2016) can be considered as a major source of concern in this 21st century where science and technology are strongly emphasized. This is owing to the fact that, teaching and learning of mathematical concepts and their proper application in primary schools will play significant role in understanding everyday phenomena as well as science and technology-based subjects in primary schools and junior secondary schools. While conducting a baseline survey on mathematics and science, the Federal Ministry of Education (2000) in SMASE, reveals that, mathematics teachers in primary schools perceived the following topics as posing difficulties for children: Measurement, 3 dimensional shapes, Multiplication and division in base two, Conversion from base two to base ten, Ratio and proportion Word problem.

Remediation on the other hand, can be viewed as the assistance intended to help pupils who have been identified with difficulties in a particular topic or subject in order to overcome such difficulties. Mathematics difficulties have been categorized by Howell (2011) into different categories of learning disabilities which include mathematics computation disabilities and mathematics reasoning disabilities. These are based on child's performance in classroom which is the outcome of his learning difference. It is on the basis of this, the research titled, Remediation of Mathematics learning difficulties among children of primary schools in Kaduna State.

STATEMENT OF THE PROBLEM

Mathematics is universally recognized as all-important subject that plays a significant role in preparing children for functional living in this scientific and technological age. For this reason, effort is put in place in order to improve the quality of teaching and learning of mathematics at all levels of primary schools. In spite of this universal recognition of the importance of mathematics to the scientific and technological development of children and the considerable effort being made by educationists, mathematicians, mathematics educators and researchers towards improving the quality of teaching and learning mathematics in primary school, yet as lamented by educationists, there is poor mathematics in the primary school level. For instance, the research conducted by strengthening science and the mathematics education (SMASE) 2010 revealed, that about 75% of the mathematics on topics were found to be difficult for the pupils which generally made their performance to be very low as a result of their lack of proper understanding of the basic concepts of the topics.

It was also found that, significant number of children from upper primary schools cannot make sense of mathematical expression like conversation of base 10 numbers to other base, addition and subtraction of numbers in basic two (2), solve problems involving ratio, these show that, pupils in upper primary schools encounter some difficulties in learning mathematics. In order to make greater achievements in terms of learning mathematical concepts and skills in upper primary school, it is important to identify the basic causes of these difficulties and provide remediation.

In the two zones area also, there is evidence of mathematics learning difficulties among pupils. This is depicted by the results of the researcher's interaction with most pupils. also a great anxiety and lamentation have been expressed by parents and secondary school teachers that considerable number of students enrolled to them could not perform simple mathematical operations except with much difficulty. the situation highlighted above calls for remediation in order to check the perceived difficulties experienced by the pupils in learning mathematics .it is for this reason the researcher developed the interest to embark on this research titled remediation of mathematics learning difficulties among upper primary school pupils in the two zones area of Kaduna state. The current situation really constitutes the problem that prompt the researcher to concern himself with the remediation of mathematics learning difficulties among upper primary school in the two zones.

Objectives of the Study

The general objectives of this research is to assess the effects of remediation of mathematics learning difficulties among upper primary schools in Kaduna state and specifically

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the research has the following objectives. To determine

1. The mean difference in the pupils' academic performance in mathematics among upper primary school children in Kaduna state before and after remediation
2. The mean difference in the performance between males and females in upper primary school in Kaduna state after remediation.
3. The mean differences in mathematics performance between the pupils of Rural and Urban schools in Kaduna state after remediation.

Research Questions

The research work has the following research questions to guide the conduct of the study.

1. What is the difference in the pupils' academic performance in mathematics before and after remediation?
2. What is the difference in between the males and females in upper primary school in Kaduna state after remediation?
3. What is the mean differences in mathematics performance between the pupils of Rural and Urban schools in Kaduna state after remediation?

Research Hypotheses

The Research has the following Null Hypotheses

H01: There is no significant difference in pupil's academic performance in mathematics before and after remediation.

H02: There is no significant difference between the male and female pupils in upper primary school in Kaduna state after remediation.

H03: There is no significant difference in academic performance between pupils of rural and urban school in Kaduna state after remediation.

LITERATURE REVIEW

Concept of Remediation

In order to remediate pupils' mathematics learning difficulty in a certain area, it's important first to understand the definition of remedial. Sharma (2014) defined, remedial instruction as the process of providing help to pupils who are experiencing difficulties so that they can understand and master the concept with which they are struggling. In math, each concept is the foundation for new learning, and when a student has not mastered one concept, they are unable to move on to the next concept. In this case, remediation helps to get the student back on track so they can continue their learning on the math continuum. Teaching remedial math means working with pupils who might be missing foundational skills that are required for learning higher level concepts. Whether because of a learning difficulty or another situation that impacted their learning, these are pupils, for example, who may not have mastered adding one-digit numbers and are now being asked to add two-digit numbers with regrouping.

Types of Remediation

According to Bola and Rao (2014) student have shown that, the remedial instruction proved profitable in case of specific learning difficulty in a specific subject, like mathematics. First, the deficiencies are determined and firmed by the experts giving these children some diagnostic test. According to Bola and Rao (2014) short frequent lesson should introduce instead of long lesson every week. Also practice, drill and review should be given importance to by teacher while dealing with children with learning difficulty. Repetition and direction should be emphasized.
Basically, according to Bala and Rao (2014), the following types of remediation have been identified.

1. Intensive remediation: is a type of remediation that is used commonly in the class room for pupils with several learning difficulties the purpose of this type of remediation is to create enjoyable and understandable social experience for the pupils. The essence is to find a way of responding to the pupils' behavior.

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2. Large group session remediation: This is a kind of remediation that is offered to a large number of pupils with associated learning difficulties.
3. Small group session remediation: This is the type of remediation that is offered to a relatively small number of pupils due to severity of their learning difficulties.

Also as affirmed by the literacy news (2009), remediation can be given to children from a number of approaches, remediating learning difficulties can be done through various ways for example according to David and Mohammed (2002), remediation cannot be carried out through correction of specific errors that is likely to give pupils more isolated piece of information to remember causing them even greater strain and increasing the probability of failure. However, if the remedial pupils do not develop more versatile forms of thinking available to the more able pupils, ill-equipped to cope with the mathematical courses which follow and cognitive to suffer cognitive strain. In this respect, remediation should be carried out by not focusing on specific errors made by pupils but rather on the overall strategies used by the more successful pupils to succeed. Remediation can be carried out individually or in group after a specific content is taught and is found to be difficult among pupils after repeated instructional delivery.

Remediation of Mathematics Learning Difficulties

According to Sharma (2014), children experience mathematics learning difficulties for a variety of reasons including: dyscalculia, dyslexia, cognitive delay, delay in the development of key mathematics milestones, poor preparation in prerequisite skills and inappropriate learning experiences. Remediation is also encourage as associated by Rao and Edgier (2011) whenever difficulties are noticed in individual learners.

Remediation is the action taken to reverse the established patterns of performance by pupils who are already struggling or failing to achieve success in mathematics and who need intensive, long- or short-term help. This involves supplementary instruction on concepts in which pupils should have mastered but have not. For example, a child may find it difficult to establish the relationship between factors of numbers, fraction and ration. Such a child may not be able to solve problems like 350m: 1km = 350:1000m = 350 = 7m 1000 20m Such a child needs remediation for proper understanding of ratio.

A remedial activity is one that is meant to improve a learning skill or rectify a problem area. Remedial instruction involves using individualized teaching of pupils who are experiencing difficulties in specific subject areas. The first advantage is learning basic skills. Remedying deficiencies is needed in order to correct the learning difficulties of pupils, which must be followed by using a developmental strategy of instruction. Roa and Ediger (2011), recommend that remediation should always be used after individual learner. Progress in mathematics is diagnosed.

It should be understood that remediation cannot be done at the same time as starting the main course, burdening an already overburdened mind with yet more to do. One possibly is to adopt remedial strategies in a constructive confidence-building manner in a foundational course prior to taking further study (Tall and Razil, 2002). Similarly, Westwood (2000) call for remedial classes in the identified areas of difficulties after they have had found difficulties in solving equation involving difference of two squares, cross-multiplication and solving equation using the methods of elimination and substitution, graph, variation and computational problems among Junior Secondary School level.

Effect of Remediation on Mathematics Learning Difficulties

A question that is often asked is that are pupils who are found to have mathematics learning difficulties capable of benefitting from remedial teaching? This question based on the empirical evidences can said to be affirmative. According to Sharma (2014), Pupils who do not have basic math and reading skills will benefit from attention to remedial activities in the

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classroom. Using phonics, Dolch words or basic multiplication tables as teaching tools will give pupils the basic skills they need to advance to a higher academic level. As highlighted by Sharma (2014) the following can be considered as the benefits of remediating learning difficulties among children.

Reinforcement

Pupils who have been out of school over summer, winter or spring breaks may benefit from remedial teaching over a week or more to reinforce skills they lost due to extended time away from school. Teachers might use flashcards, games or fun activities involving phonics and basic math to help pupils get back on the learning path.

Help for Dyslexia

According to research from Carnegie Mellon University, remedial teaching instruction can help pupils with dyslexia overcome their reading difficulties by helping to rewire brain connections. The study, published in the August 2008 issue of the journal "Neuropsychological," showed that 100 hours of remedial instruction is enough to help pupils with reading deficits related to dyslexia increase neural connections and increase reading proficiency over the long term.

Communication Skills

Pupils who suffer from speech disorders may have trouble with communication in the classroom. Speech disorders are often developmental and may respond to remedial reading instruction. Teaching reading using phonics and sounding-out activities may help pupils with communication issues from speech-related problems become more academically proficient.

Behavior and Motivation

Pupils who fall behind due to the inability to perform even the most basic tasks in the classroom may develop behavior problems because of their frustration levels. This can also lead to a lack of motivation and the desire to give up altogether. Teaching remedial activities will help pupils gain general knowledge that can be applied to all subject areas and help reduce feelings of inadequacy that lead to behavior or motivation issues.

Concept and Nature of Mathematics

Mathematics by its own nature is regarded as a science of space, numbers, magnitude and measurement. According to Sunnetha, Rao and Rao (2014), there is no unified definition of mathematics that is universally accepted. Generally, there are many definitions of mathematics. For instance, some define mathematics as a science of calculation, some as science of space and numbers and so on. The various definitions however share many similarities. For this reason, on the basis of these assumptions of mathematics, mathematics as affirmed by Suneetha et al (2014) can be seen as the science of numbers, word, signs etc. which we can know about magnitude, direction and space.

Importance of Mathematics

Mathematics is viewed as the vehicle to train the child to think, reason, analyze and attribute logically. Mathematics, apart from being a specific school, it is also treated as vital component to any subject that involves analysis and meanings. Mathematics is a systematized, organized and exact branch of science. It deals with quantitative, facts and relationship of number logical reasoning. It is an experiential inductive science which draws necessary conclusion. Mathematics is an important subject in school curriculum. It is more closely related to the daily lives of the children as compared to other subjects.

It holds an important pace in the curriculum, thus it is made part of the core subject in the curriculum, because it helps to develop the pupils as social and intellectual citizen. It also develops these qualities that can be developed by other subjects. It is considered as the father of science. The progress and development of mathematics is linked to the prosperity of the nation, because it helps in the understanding of other science subject. Mathematics has intellectual, moral, utilitarian, social, cultural and vocational value.

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Concept of Learning Difficulties

The term "learning difficulties" according to Akande, Olowonirejuaro and Abolarin (2010) in the most recent time is used to describe children who suffer significant difficulties in acquiring basic academic skills. They further affirm that, learning difficulties have now been established as disabilities that cause serious impediment to school learning. Children and youth with learning difficulties are found in every classroom, if their problems are not diagnosed and treated, such children are labeled negatively and could be abandoned educationally. Bordini in Akande et al (2010) observed that, learning difficulty affects the way children of average intelligence and above receive, process or express information…

It impacts the ability to learn basic skills of reading, writing or mathematics. Learning difficulties is sometimes called learning disabilities. Which has various definitions and the definitions that are acceptable to all remains a debate table issue. Yasoda (2013) Asserts that learning is the progressive change in behavior which is associated on one hand with successive presentation of situation and on the other, with defeated effort of the individual to react to it effectively. Learning difficulty is described by Yasoda (2013) as a situation in pupils or pupils find it difficult to undertake some of the contents given them even if the teacher presents them effectively. According to Reddy and Ramar (2014) the basic diagnostic progress of learning disability is the same regardless of the ability. They further maintained that, the diagnosis of any disability is not an event; it is rather goal-oriented process that is guided by a series of questions at each stage, to answer the questions member of multidisciplinary team need to obtain data from a variety of procedure and tests. The result obtained may lead to the identification of the learning disability.

American Psychiatric Association (2000) defines diagnosis as identification of a condition, disease, disorder or problem by systematic analysis of the background or history, examination of the signs or symptoms, evaluation of the research or test result and investigation of the assumed or probable causes. They further maintained that, effective prognosis will not be possible without effective diagnosis. Akande et al (2010) posits that, the problem of learning difficulties is a universal problem that is peculiar to Nigeria alone. In fact, they further affirmed that, research has shown that, in all cultures there are children who seem to have normal intelligence but have severe difficulties in learning oral language, acquiring reading or writing skills or doing mathematics.

Yasoada (2013), defines learning as the progressive change in behavior which is associated on the one hand with repeated effort of the individual to react to it effectively. He further described learning difficulty (LD) as a situation in which pupils find it difficult to understand some of the contents given to pupils even if the teacher presents them effectively. Awopeto (2010), sees learning disability otherwise known as learning difficulty as a disorder with a basic psychological process with involves the understanding in using language, spoken or written, that vary manifest itself in the imperfect ability listen, think, speak, read, write, spell. The Federal definition of individuals with disabilities education Act (IDEA) of 1997 define learning difficulties or specific learning disability to mean those children who have disorder in one or more of the basic psychological process involved in understanding or in using language, spoken or written, which disorder may manifest itself in Difficulty Attention Deficit Disorder (ADD), retrieval short term memory, dyslexia, auditory perceptions, auditory memory, auditory discrimination, figure ground (Visual or auditory), auditory sequencing, inter-sensory disinheriting, tactile perception, vestibule or perception, depth perception.

The division of pupils supports services (2003) in their own perspective see learning disability as a disability that; recognize a continuum from mild differences in the performance to severe disabilities that effect almost all the areas of schooling which include the following elements:

1. Discrepancy between potential and performance
2. Average or above average intelligence
3. Un even development skills

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4. Exclusion of other causes
5. Assumed neurological dysfunction

As maintained by Alkande et al (2010) learning difficulties may take various dimensions this is in conformity with what was maintained by Yusha'u and Galadima (2009).The various types of learning difficulties include motor difficulties, language, reading, writing and mathematics difficulties. Accounting to Yusha'u and Galadima (2009) examples of more common learning disabilities include visual – motor integration motor planning, dysgraphia, dyscalculia (mathematics) or do mathematical calculations, including conditions such as perceptual disabilities, brain injuring, minimal brain dysfunction, dyslexia and developmental aphasia.

According to him learning disability, difficulty or learning disorder is not a problem associated with intelligence, but it is however cause by a difference in the brain that affects how information is received, processed or communicated children with learning difficulty in disability have problem with processing information, because they perceive things differently. Due to lack of proper diagnosis, children with learning difficulties are perceived as "Lazy" under achievers" even though they are intellectually less able than their peers. Learning difficulty affects children of different categories as well as adult and the impact of learning difficulty or learning disability range from relatively mild to serve as further maintained by Awepetu (2010) diagnostic and statistical manual of mental disorders text division (2000) classified learning difficulty or disorders in to three viz:

1. Reading disorder
2. Mathematics disorder
3. Disorder of reading expression

Signs of Mathematics Learning Difficulties Among Children

It has been discovered that, children frequently have average to above average intelligence and yet have difficulty with numbering mathematical facts over a long period of time Yusha'u and Galadima (2009) some days calculation may have special problems such as aligning number in to proper columns as well as exhibiting differently in performing or mathematical operation Jordan and laurie (2000) assert that, some symptoms of mathematics are grouped in to four categories, namely:

1. Language symptoms
2. Recognition or perceptual symptoms
3. Mathematical symptoms
4. Attention symptom

Pupils with language symptoms have trouble in naming mathematical learn, understanding word problem or understanding such mathematical concept as "greater than" or "less than". Pupils with recognition symptoms have difficulty in reading numbers and operational signs such as plus, minus or aligning numbers properly in order to perform accurate calculation. Mathematical symptoms include deficiency in the ability to count, to memorize such basic arithmetical data as multiplication table or to follow a sequence of steps in problems solving. Attention symptom the other hand are related to failures in copying numbers and ignoring operational signs which also sometime the results of care lesson or from lack of understanding of the factor involved in solving a particular problem. It is further suggested that, parents and teacher may see the following signs of mathematics difficulty in children school work.

1. Problems in counting
2. Difficulty memorizing multiplication tables
3. Poor computational skills
4. Slowness in performing calculations
5. Difficulty arranging numbers in order
6. Inability to grasp information on graphs
7. Difficulty understanding word problem
8. Inability to understand mathematical symbols.

According to Yusha'u and Galadima (2019) the following are the basic signs of mathematics learning difficulties among pupils

1. Difficulty with number sense
2. Difficulty in learning to count
3. Trouble in recognizing printed number

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4. Difficulty with connecting the idea of a number with what represent in the real world
5. Poor memory of numbers
6. Trouble with organizing things in a logical way, sorting by shapes, size, color, etc.
7. Trouble recognizing group and patterns
8. Trouble in comparing and contrasting smaller/large, taller/shorter
9. Trouble in learning mathematical facts
10. Poor long-term memory for mathematical function
11. None familiar with mathematical vocabularies
12. Difficulty with measuring proof
13. Avoid game that require strategy
14. Difficulty in dealing clock
15. Not comprehending writing numbers
16. Problem with time perception which lead to problems with planning time required to complete a task

Dyscalculia basically means difficulty in performing mathematical calculations specifically means learning disability which affect mathematics. According to Henderson (2012) some of the main symptoms of dyscalculia or mathematics learning difficulty are:

1. Spatial problem and difficulty aligning numbers in proper columns. Number sequencing including left/right orientation
2. Finding mathematics concept in word problem difficult to understand, confuse similar number e.g. 7, 9, 3, 8.
3. Difficulty with abstract concepts of time and direction, the inability to recall schedule and to keep track of time
4. Where there is sensory defect, the mathematics deficiency is worse than one would expect.

Henderson (2012) further asserts that, it is also common for pupils with dyscalculia to have normal or accelerated language acquisition, verbal, reading, writing and good visual memory for the printed word, but they may have poor lo0n-term memory of mathematical principles. They may be unable to mentally calculate charge due from purchases which may results as a money or shopping phobia. They may have poor athletic coordination, conduct disorder attention deficit disorder, depression and other learning disorders.

Concept of Mathematics Learning Difficulties

Learning difficulties in mathematics is said to be less frequent in than reading difficulties. (Bordini, 2007). According to Bordini (2007) learning difficulties upon the child's strengths and weakness it was further said that, child's disability or difficulty in mathematic is affected different by a language learning disability or visual disorder or difficulty with sequencing, memory or organization. As further maintain by Bordini (2007) a child with mathematical based learning difficulty may struggle with memorization and numbers, operation system and number facts. According to Gordon cited in Jordan and Laure (2002) Dyscalculia or mathematics learning difficulties is a specific disturbance in learning mathematical concept and compilation and it is also associated with a contract nervous system dysfunction. It was further asserted that in some cases, mathematics difficulties begin at an early age.

Yusha'u and Galadima (2009) maintain that, mathematics learning difficulty or dyscalculia is a difficulty or challenges one will not have in which a person has un-usual difficulties in solving mathematical problems and grasping mathematics concept, memory of mathematics concept of time money etc. they further assert that, dyscalculia in mathematics learning difficulties is said to be learning difficulty that is other to dyslexia, where the learning difficulty is associated with understanding and using mathematical symbols or function needed for seen in mathematics. According to Jordan and Laurie (2012) dyscalculia or mathematics learning difficulty is a learning disorder in which a person's mathematical ability is substantially below the level normal expected based on his or her age, intelligence, life experiences, educational background and physical impairments. The problems or disability affects the ability to do calculations as well as the ability to understand

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word problems and mathematical concepts. Mathematics learning difficulty otherwise called developmental arithmetic disorder, developmental dyscalculia or dyscalculia. It was further posited by Jordan and Laure (2012) state that mathematics disorder was first describe as developmental disorder in 1973 and since that time it has come to include a number of dysfunctional types of special type of special mathematics differences which include:

1. Difficulty in reading and writing numbers
2. Difficulty in aligning numbers in order to calculation
3. In ability to perform calculations
4. In ability to comprehend word problems.

Kolawole (2010) whose highlight the type of learning difficulties among Nigerian assert that, mathematics difficulty include difficulty in learning math concepts, such quantity, place, value and time, difficulty in measuring and organizing number, operations, math numbers, facts and difficulty with counting principle, (such as counting in 2s or by 5s and so on. Awopetu (2010) supporting Yusha'u and Galadima (2013), Kolawole (2010) affirms that mathematics difficulty (dyscalculia) is a difficulty characterize by a problem in doing mathematics, problem in understanding time and using money.

British Dyslexia Association (2010) described mathematic difficulty (Dyscalculia) as condition that affects the ability to acquire, mathematics skills. Dyscalculia learners may have difficulty and understanding number concepts, lack of intuitive grasp of numbers, problems of learning number facts and procedures. Specifically, learners with these problems may have inconsistent result in addition, subtraction, multiplication and division; they may also have poor mental mathematics ability. Quite a number of researches have been conducted about different types of learning difficulties among children, such as dyslexia, dysgraphia etc and in particular mathematics learning difficulties.

In a study conducted by Musa cited in Ekoja and Clifford (2010), he mentioned different types of learners with specific difficulties, such as dyslexia, dysgraphia and dyscalacia. Dyslexia according to Musa (2010) is described as combination of abilities and difficulties that affect the learning process in one or more of reading, spelling and writing. Pupils with this kind of difficulties have a marked and persistent difficulty in learning to read, write and spell despite progress in other areas. Dysgraphia is described as difficulty in writing which most cases result in illegible and inaccurate spelling of words. Children with type of problem are generally characterized with illegible writing, letter in consistencies, mixture of upper/lower unfinished letters and struggle to use writing as a communicative device. This problem of difficulty can affect a child in his effort to draw some shapes and express himself mathematically in letters.

Inclusive technology (2009) in their research categorized learning difficulties into four broad groups depending on how a particular copes with the curriculum instruction. These categories are as follows:

1. Moderate learning difficulties (MLD) This category have difficulties with learning across all areas of school curriculum – including mathematics difficulty.
2. Specific learning difficulties such as dyslexia.
3. Severe learning difficulty (which is characterized) by significant intellectual or cognitive impairment difficulties in motorability and coordination, communicative skills with effect on the ability to participate in the school curriculum without support.
4. Profound and multiple learning difficulties (PMCD) characterized by very severe learning difficulties with other significant difficulties, such as physical disabilities, sensory impairment or severe medical condition.

So, with this knowledge of categories of learning difficulties, teachers can explore and provide more ways to remediate mathematics learning difficulty among children of upper primary school, hence this study is related to the topic. Also in a study conducted by Bordini (2009), it was

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revealed that learning difficulty associated with mathematics is less frequent that reading difficulties affecting 1% of school children. According to the study learning difficulties in mathematics vary greatly and it all depended upon the child's weakness and strengths. For example, a child's mathematical ability is affected differently by a language learning ability visual disorder or difficulty with sequencing, memory or organization.

The study conducted by Swason and Asbaker (2000) and Toresen (2002) revealed that, children with both reading and mathematics difficulty suffer from a domain general capacity intimidation in working. According to Merck Manual of Patient symptoms (2009) about 20% to 60% of children with DHD have learning difficulty. This finding concur with Yushau and Galadima (2009) which asserted that, Attention Deficit Hyperactive Disorder (ADHD) is part of behavioral disorder that is concurrent with leering difficulty. Therefore, children diagnosed to have difficulty in paying attention, tend to act quickly without proper thinking very thorough, rarely learn from past mistakes and have trouble sitting still for lengthy periods. It is for this reason, they maintained that mathematics, teachers' knowledge for the common learning difficulties such as dyslexia, dyscalculia, dysgraphia and other disorders like ADHD are associated with learning difficulties is very fundamental. This will provide a means for meeting up challenges of accommodating children with special needs in the classrooms.

Sharma (2014), is his research believers that, children experience mathematics learning difficulties for variety of reasons which among others include dyslexia, cognitive delay, delay in development of the basic keys of mathematics milestones, poor preparation in prerequisite skills and inappropriate learning experiences. This situation, therefore demands a plan for intervention by the teacher in order to help the pupils. Through this intervention process, the pupils' difficulties or weakness are quickly addressed before they become serious problem.

Brain (2019) asserts that dyscalculia learners may have difficulty in understanding simple number concepts, lack an intuitive grasp of numbers and have problems learning number facts and procedures. Even if they produced correct answers or use correct method, they may do so mechanically without confidence. Very little is known about the prevalence of dyscalculia, it causes or treats most dyscalculic learners will have cognitive and language abilities in the normal range and may excel in non0mathematical subjects.

This situation is described above also calls for proper and early diagnosis of pupils or pupils with mathematics learning difficulties for early intervention. In an attempt to exemplify pupils' difficulties in mathematics Yusha'u (2006) cited Howell (2016) who categorized mathematics difficulties into two broad categories of learning disabilities, viz: mathematics computational disabilities and mathematical reasoning disabilities, both of which also are characteristics of dyscalculia and the two categories are based on child's performance in classroom which is also the outcome of his or her learning differences.

Sharma and Brazil (2019), sees dyscalculia as the inability to conceptualize numbers, number relationship and outcome of numerical operation. While relating dyscalculia with dyslexia, Sharma and Brazil (2019) wrote that:

1. Dyscalculia is proving to be widespread than dyslexia
2. Although some dyslexics have similar problems with sequencing and organization of the dyscalculia stems from the language concepts and procedures of mathematics.
3. Dyscalculia has two categories of origin: (i) Neurological/cognitive and (ii) Environmental/physiological.
4. Environmental factors include individual's mathematical learning ability, presence or absence of pre-requisite skills, adequate development of mathematical language and teaching mathematics. Sharma and Brazil (2019) also advocate for appropriate teaching methods to match the student's needs to as to achieve the desired progress.

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In a study carried out by Galadima and Yasha'u (2014), which investigated the mathematics performance of senior secondary school pupils in Sokoto State, revealed the existence of learning difficulties in mathematics and conformed no gender difference in performances. Also the study conducted by Yasha'u (2013), which focused on investigating and remediating gender difference in mathematics performance among dyslexic and dyscalculia learners in Sokoto confirmed that no significant differences in the academic performance of experimental groups between gender dyslexic and dyscalculia after remediation. The study therefore recommends that investigation and remediation of dyslexia and dyscalculia pupils should always be carried out by mathematics teachers so as to reduce the level of mathematics learning difficulties as well as preventing the existence of gender difference among pupils in mathematics.

According to Iriving and Martin-Denham (ed) in Martin-Denham (2015) the word dyscalculia comes from two words "dys" meaning difficulty and "calculi a" meaning to calculate. Therefore, pupils with dyscalculia have a specific difficulty with mathematics and often are unable to acquire the basic concepts that underpin the skills necessary for performing mathematical procedures, which can impact on a a very simple activities, such as counting and comparing small numbers. For example, a child with this problem may be unable to state which is bigger between 2 and 4. She further maintains that, the children with dyscalculia may be unable to visualize numbers or see relationship between numbers. They may also experience difficulties of counting in groups of numbers, recalling times tables or facts and using strategies for basic calculations. Pupils with dyscalculia often have difficulties with working memory, therefore during timed assessment, they are likely to become particularly stressed. Irving and martin-Denham (2015) further listed commons of dyscalculia. They are:

1. Slower responses to number problems than pupils of the same age.
2. Failing to understand the basic concept of numbers.
3. Counting on fingers and an inability to recognize small numbers without counting.
4. Difficulty in counting dots in array.
5. Inability to tell time from an analogue clock.
6. Forgetting previously understood procedures quickly.
7. Being poor at estimation tasks.
8. Difficulty with estimating time
9. Avoidance of tasks and fames which involve calculations.

As hinted by Chinn (2016), nevertheless, it is of value to reflect on some definitions. If one takes a parallel with dyslexia, also a specific learning difficulty, the definition proposed by the Department for Education and Skills (DFES, 2011) has some resonance: Dyscalculia is a condition that affects the ability to acquire mathematical skills. Dyscalculic learners have difficulty understanding simple number concepts, lack of intuitive grasp of numbers and have problems learning facts and procedures. Even if they produce a correct answer or use a correct method, they may do so mechanically and without confidence. Chinn (2013), further asserted that a thorough review of research into dyscalculia was provided by Ramaa and Gowramma in 2002. Their review remains opposite today in that it highlighted the key factors that contribute to dyscalculia (and thus also mathematical learning difficulties). And from Kaufman et al (2003), the specific problems exhibited by children having mathematics difficulty are:

1. Mastering the skills pre-requisite for arithmetic achievement.
2. Mastering the basic computational skills, time and money concepts.
3. Acquiring conceptual knowledge.
4. A further review of research identifies the main factors involved in dyscalculia and mathematical learning difficulties:
5. Preservation of counting strategies,
6. Recall of basic facts
7. Speed of working (including speed of retrieval of facts and procedures)

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8. Working memory and short-term memory
9. A lack of understanding of place value
10. Word problems and problem solving.

Causes of Mathematics Learning Difficulties

The range and number of mathematics difficulty that have been document suggest that, there are several different causes for mathematics difficulty. Tuner syndrome and fragile syndrome which are both genetic disorder that affect girls, are associated with difficulty in mathematics. (Jordan and Laurie, 2000). It has also been ascertained by Jordan and Laurie (2019) that, injury to certain parts of the brain can cause in ability to perform calculations. But this condition they appear to be independent of other causes of mathematics learning disorder. According to Yusha'u and Galadima (2019) mathematics teachers are expected to acquire themselves with the knowledge of the basic causes of learning difficulty in mathematics dyscalculia as well as their symptoms or signs. The basic causes of dyscalculia accordingly are:

1. Visual-spatial difficulties
2. Weakness in visual processing of numbers and mathematics situations
3. Auditory processing difficulties
4. Attention deficit
5. Information processing deficit
6. Problem with sequencing, organizing, informal
7. Problem with understanding concept and symbols

Fletcher (2007) enumerated four factors that cause pupil or student learning difficulties. They are:

1. Physiological factors such; as vowel defect auditory defect. Such types of defects are usually beyond remedy by the class teacher.
2. Social factor; this can be from home or in school. Lack of culture advantage in the home may handicap pupils to do well in academic. Social factor may also influence pupil performance within class room.
3. Emotional factor; fear of failure in the present and the past.
4. Intellectual factor; this in a situating where pupil factor it difficult to remember certain concept and principle.
5. Pedagogical factor; here the difficulty rest on the ineptitude of the factor to be added to specific difficulties.

Specific learning difficulties is defined Merck (2009) an unexpected and explained condition, occurring in a child of average or above average intelligence characterized by delayed in one or more areas of learning. According to Merck (2019) the areas of specific L A can be grouped in to two groups namely.

1. Basic academic skills difficulties such as reader writing spelling arithmetic which are central to school succeed.
2. The second group pertain areas which involve such skills as significant persistence, organization, impulse control, social competence and the co-ordination of movement.

Effects of Mathematics Learning Difficulties

Mathematics learning difficulties among children have serious effects on children. Akande et al (2010) affirmed that, children with difficulties in learning Mathematics are usually at more risk for developing psychological difficulties taking into consideration the repeated failure they experience as they fight their way through the educational system which may ignore their needs. They further maintain that, specific learning difficulty makes the lessons difficult for them. The children with such problem usually have a hard time to keep up with their classmates and they consider themselves as being poor.

Sometimes the problem affects their level of concentration on lessons which lead to boredom that is they easily get bored. Learning difficulties also makes the child to develop negative self-image as a result of constant struggle and failure which also affect their academic and social life. In fact, a research conducted as stated by Akande (2010) indicated

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that, as many as 70% of children with learning difficulty suffer from poor self-esteem. It was also maintained that; those categories of children may also enter in to a state of "learned helplessness".

The research further indicated that 75% of children with learning difficulties exhibit social difficulties such as making and keeping friends. Poor performance in school also undermines their self- confidence which makes it hard for those categories of children to make and keep friends. The children may likely drop out from school pre-mutually. According to Broach (2009) individual which leaning difficulties may have increased level of anxiety, may be at greater risk of depression and may also experience highest level of loneliness. Such children may have poor self-concept, may be at greater risk for substance abuse and may also be at greater risk for juvenile delinquency.

It is further maintained by Kolawale (2010) that, learning difficulties affect children in a number of ways. For example, it may make them to isolate themselves from school and society. Learning difficulties also make children to ashamed clue to types of difficulties they struggle with like poor literacy skills, attention or memory difficulties. It also makes them; Have fear of discrimination, Have fear of failure, criticism, ridicule or rejection, Fear of being labeled as stupid, Have feeling of by depress and tow self-concept, Alone, timid and quiet, Feel ashamed of being unable to read and write very good, being left out of everyday children because of poor understanding. From what has been said so far, it can be discerned that, learning difficulties in one way or the other cause challenge that affects children education because of its multi-dimensional effects on the child's academic and social life. In fact, it constitutes a great stumbling block to the acquisition of basic skills by the child. Mathematics learning difficulty affects children not only in their ability to handle mathematics but also affect other skills. This is also because skills and concept in mathematics are used everywhere.

Butterworth (2003) asserts that, children with dyscalculia may find some every day skills as being difficult to them. Some of these skills are:

1. Social skills: Failing in math class can lead a child to assume that, failure is in evitable in others areas too. Low self-esteem can therefore affect child with willingness to make new friends or participate in after school activities. The child may avoid playing games and sport that involved math and keeping score.
2. Sense of direction: a child with math difficulties may have trouble getting places by reading maps or following directions.
3. Physical coordination: A child math reading difficulties may trouble in judging distance between objects, because dyscalculia affects how brain and eye work together.
4. Money management: Dyscalculia can also make it difficult to stick to a budget, balance and checkbook and estimate cos.

Time management:

Dyscalculia can also affect child's ability to measure quantities; including unit of time, a child may also have trouble figuring out how much of the ingredient. To use in recipe. He might have a hard time how fast can another can is moving or how far is away. Some times as further maintained by Butterworth (2013) states that, dyscalculia can take such a toll on children's self-esteem that anxiety and depression can set in.

Types of Difficulties Associated with Mathematics

Difficulties associated with mathematics have been categorized into different categories or types. Butterworth (2013) categorized difficulty in mathematics as follows:

1. Mathematical comprehension; a child with this difficulty may not able to tell what a number represents for example may not realize that '7' come before 8.
2. Operational difficulty; a child with this difficulty may not be able to carry out simple calculation but always rely on his finger.

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3. Selection process difficulty; may find it difficult to carry out operation in that involves word problem where the appropriate operation is not specified.
4. Sequential memory
5. Abstract symbolization in algebra problems
6. Difficulty in Cluster – objects individually.
7. Graphic representation of number
8. Concrete mathematical manipulation
9. Interpreting process signs a child with this difficulty may extremely slow in working out what such signs men when they are written down.

METHODOLOGY

Research Design

The research adopted quasi-experimental design using pretest and post-test groups. Questions were selected from the areas covered by the primary school pupils. Such areas like measurement, elementary geometry (3-dimensional shapes), addition and subtraction in base two, Ratio and proportion and word problem. The researcher believed that by employing this approach, have the opportunity to organize, collect, analyze, interpret and report the position of the study. The approach is deemed fit taking into consideration the large size of the population as well as the territorial entity of the area of study.

Population of the Study

The target population of this research comprises of all the upper classes (4-6) of the selected public primary schools within the three zones of Kaduna state which consist of 23 local government areas. The 23 local governments are: Lere, Zaria, Kachia, Kagarko, Giwa, Igabi . There are one thousand three hundred and seventy five schools [1,375] where each local government conglomerates specific number of schools with the enrolment of two hundred and fifty one thousand four hundred and seventy- five [251474].

Table 1: The Population Size of the study

S/NO	Local Governments from senatorial zones	No of schools	Enrolment		
			Male	Female	Total
1.	Kaduna north senatorial zone	356	41539	37463	79,002
2.	Kaduna central senatorial zone	469	63251	56192	119,443
3.	Kaduna south senatorial zone	550	27154	25875	53,029
	Total				251,474

Source: Ministry of Education Kaduna state annual school census 2021

Sample and Sampling Techniques

Two intact classes were used in line with the Quasi design of the study.

Table 2: Intact Class Sample size of the Study

S/NO	Local Governments from senatorial zones	No of schools	Enrolment		
			Male	Female	Total
1.	Kaduna north senatorial zone	1	43	72	115
2.	Kaduna central senatorial zone	1	80	35	115
	Total	2			230

Research Instrument

The instrument used in carrying this research was Kaduna Mathematics Diagnostic Test (KMDT) developed by the researchers with the assistance of some experts. The thirty (30) test items consisted of thirty (30) multiple choice test items with four (4) options were drawn from five (5) topics namely: measurement, 3-diemnesional

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shapes ratio and proportion, word problem. The thirty (30) items are line with upper primary curriculum. The test items are designed to diagnose mathematics learning difficulty and provide remediation. Both marking scheme and answer sheets were be provided.

Validity of the Instrument

Validity has been defined by Charles (2018) as the ability of the research instrument to measure accurately and essentially what is supposed to measure. In order to validate the instrument, the instruments were taking to the experts to check and validate, two experts from mathematics department and measurement and evaluation from Federal College of Education were given the instruments to validate, where content validity is expected was obtained.

Reliability of the Instrument

Reliability indicates the degree of the accuracy of what the instruments is designed to measure. According to Schnitzler (2021), a test is said to reliable when it is free from error and provides information about test scores; and to a certain degree provides repeatable consistent results. Therefore, the reliability of the instrument was established using split half and test re-test methods to ensure the reliability of the instruments. The correlation coefficient of 0.6 was obtained which were considered as good instrument.

Administration of Instruments

The researcher used the prepared thirty test items designed were administered to all the sampled schools at different days through the assistance of research assistants and the sampled schools mathematics teachers.

Procedure

A pre-test was administered to all the sampled schools on the same day using the thirty test items developed. The time specification was 1.30mins for the test. After the completion of the test, the scripts were marked by the research using the prepared marking scheme. Two groups were chosen: (i) control group and experimental group. The experimental group (EG) was given remedial instruction on measurement, 3-dimensional shapes, ratio and proportion, word problem for six weeks three period per week where 35 minutes per period was allocated to the remedial class. After that period of pre-test, the same test items were administered to both groups, that is control group (CG) and experimental group (EG).

Methods of Data Analysis

After marking the diagnostic test for all the sampled schools, the scores were converted into percentage score, the mean and standard deviation for the pupils were calculated in each topic as well as for their performance. For comparative analysis, the level of significance was used at $\chi = 0.05$. The researcher also used descriptive statistics, to analyze the data obtained from the test scores, such as t-test, while the null hypothesis was tested using t-test.

RESULTS

The data for the study was collected from two zones Kaduna north senatorial zone (zone 1) and Kaduna central Senatorial zone (zone 2) where schools were selected from rural and urban centers. Two and thirty pupils (230) were used for the experiment to determine the effect of remediation of mathematics learning difficulties among pupils of upper primary schools in Kaduna state Nigeria among pupils. The analysis of the is given below.

Research Question One

What is the significant difference on pupils' academic performance in Mathematics before and After Remediation?

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Table 3 Mean and Standard Deviation of Pupils Academic Performance in Mathematics before and after Remediation

Remediation	N	Mean	St. Div.
Before	115	17.44	5.42
After	115	25.02	1.79

Table 3 revealed the mean and standard deviation of pupils' academic performance in mathematics before remediation is (N = 115, M = 17.44, SD = 5.42) and after remediation is (N = 115, M = 25.02, SD = 1.79). this indicates that, after remediation pupils performed more than the before remediation.

Research Hypothesis One

There is no significant difference in pupils' academic performance in Mathematics before and after remediation.

Table 4: T-test Analysis on Pupils Academic Performance in Mathematics Before and After Remediation

Remediation	N	Mean	St. Div.	df	t	p
Before	115	17.44	5.42	228	14.23	0.000
After	115	25.02	1.79			

Table 4 shows that, there is significant difference on pupils' academic performance in Mathematics before and after remediation. The p-vale is 0.000 which is less than alpha value of 0.05 level of significance, this means that, there is significant difference between before and after remediation in favour of after remediation. Therefore, hypothesis one is rejected.

Research Question Two

What is the significant difference on academics' performance of Male and female pupils in Mathematics after remediation?

Table 5: Mean and Standard Deviation on Academic Performance of Male and Female Pupils in Mathematics after Remediation

Gender	N	Mean	St. Div.
Male	43	25.23	1.74
Female	72	24.89	1.82

Table 5 revealed the mean and standard deviation on academics' performance of Male and female pupils in Mathematics after remediation of Male is (N = 43, M = 25.23, SD = 1.74) and after remediation of female is (N = 72, M = 24.89, SD = 1.82). this indicates that, after remediation male and female pupils performed almost similar.

Research Hypothesis Two

There is no significant difference on academics' performance of Male and female pupils in Mathematics after remediation.

Table 6: t-test Analysis on Academic Performance of Male and Female Pupils in Mathematics After Remediation

Gender	N	Mean	St. Div.	df	t	p
Male	43	25.23	1.74	113	0.995	0.322
Female	72	24.89	1.82			

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Table 6 shows that, there is no significant difference on academic performance of Male and female pupils in Mathematics after remediation. The p-vale is 0.322 which is greater than alpha value of 0.05 level of significance, this means that, there is no significant difference between male and female academic performance after remediation. Therefore, hypothesis one is retained.

Research Question Three

What is the significant difference on academic performance of rural and urban pupils in Mathematics after remediation?

Table 7: Mean and Standard Deviation on Academic Performance of Rural and Urban Pupils in Mathematics after Remediation

Location	N	Mean	St. Div.
Rural	35	22.06	4.86
Urban	80	25.23	1.74

Table 7 revealed the mean and standard deviation on academics' performance of rural and urban pupils in Mathematics after remediation of rural is (N = 35, M = 22.06, SD = 4.86) and after remediation of urban is (N = 80, M = 25.23, SD = 1.74). This indicates that, after remediation urban pupils performed higher than rural pupils.

Research Hypothesis Three

There is no significant difference on academics' performance of rural and urban pupils in Mathematics after remediation.

Table 8: t-test Analysis on Academic Performance of Rural and Urban Pupils in Mathematics After Remediation

Location	N	Mean	St. Div.	Df	t	p
Rural	35	22.06	4.86	113	4.124	0.000
Urban	80	25.23	1.74			

Table 8 shows that, there is significant difference on academic performance of rural and urban pupils in Mathematics after remediation. The p-vale is 0.000 which is less than alpha value of 0.05 level of significance, this means that, there is significant difference between rural and urban academic performance after remediation. Therefore, hypothesis one is rejected.

DISCUSSION OF THE FINDINGS

The findings of the study reveal that, there is existence of learning difficulties among upper primary school pupils in the two zones which may be attributed to the factors highlighted in the introduction. The findings from testing of hypothesis one which was on pupils academic performance mathematics before and after remediation in those topics like ratio and proportion, multiplication and division, addition of numbers in base two, etc in the two zones revealed that, there is significant differences in pupils academic performance in mathematics before and after remediation.

The findings agreed with the assertion made by Sharma (2004) which maintained that, pupils who do not have basic mathematics skills and therefore experiences difficulties in understanding some concepts benefit for attention to remediation. The finding is also in conformity with that of Prediger (2016) and Phoebe (2014) which states demonstrated that remediation, significantly reduce deficit in learning mathematics among middle school students.

The findings of hypothesis two, which was on pupils' mathematics academic performance in upper primary school in the two zones between boys (male) and girls (female) reveled significant differences between boys and

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girls before and after remediation. This therefore led to the rejection of the hypothesis.

Lastly, the findings of hypothesis three which was on mathematics academic performance between pupils of rural and urban schools in upper primary schools after remediation in the two zones. The findings also confirmed that there is a significant difference in mathematic academic between pupils of rural and urban schools in upper primary schools after remediation therefore, the hypothesis is rejected.

CONCLUSION

1. There significant difference in pupils academic performance in mathematics before and after remediation in the two zones area of Kaduna state. Results on the performance of pupils before and after remediation revealed that, there is significant performance before and after remediation.
2. There is significant different in pupils academic performance in mathematics between boys (male) and girls (Female) after remediation as revealed by the result.
3. There is a significant difference in pupil's mathematics academic performance at pupils of rural and urban schools before and after remediation. The above findings revealed the importance of remediation in every mathematics were difficulty in identified.

Implication of the Study

The results obtained from the application revealed that pupils of upper primary schools in the two zones experience some difficulties in understanding some mathematical concepts in reaction and proposition the achievement etc. this may have a lot of implication for primary education and for further learning, mainly in the science and technology based subjects. However, through remediation, the anomaly can be revitalized to the barest minimum hence, through remediation, learning difficulties among pupils can be drastically reduced. Remediation of mathematics learning difficulties has the following implications.

1. Through constant remediation, understanding of mathematical concepts at upper primary schools can be greatly enhanced and improved.
2. When children cultivate positive understanding in mathematics it will lead to proper understanding and progression of science and technology-based subject of which mathematics is central to their understanding, thus remediation paves way for important breakthrough in scientific and technology development.
3. The remediation, on revealed in this finding may contribute to the pupils understanding of mathematics which is vital in understanding of every day phenomena, thus it will help the pupils to be able to understand the world better and be able to address further challenges tactfully.

RECOMMENDATIONS

In consideration of the difficulties experience by the pupils in understanding mathematical concept at upper primary in most topics target at primary school coupled with the high demand of exigent need of mathematical knowledge in the entire educational system and its needs in the area of science and technology and based on the conclusion recommendations the following recommendation are given.

1. Remediation of mathematics learning difficulties among pupils should be accorded serious attention at all level of our educational system.
2. Once difficulties are identified among pupils in a particular topic or sub-topic, remediation should be given immediately to the pupils.
3. Adequate remediation should be given to pupils of primary schools in rural area across the basic schools and methodologies of classroom teaching of mathematics in primary schools should learner centered approach.

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REFERENCES

Akande J.A, Olowonijuaro A.O Abolarin EE, (2010) Dimension of Learning difficulties (ed) in Learning Difficulties and the Nigerian Child

American Psychiatric Association (2000). Diagnostic and Statistical Manual of Mental Disorder 4th Edition Washington D.C

Awopetu R.G. (2010) Prevention treatment and Intervene 'Strategies for learning disability in children (ed) Ref. No

Bala E and Rao D B,(2014)Remedial teaching for children with math learning difficulties. Discovery Publishing House .India

Boalar J(2015)the elephant in the classroom 2nd edn. London: souvenir press

Bob B(2016) Learnig theory Simplified SAGE publication ltd London

Bordini, E. J. (2007). The ABC's of Learning Disorder http:/cpanet.com/article files/learning-disorder.asp retrieval on 16th June, 2016

British Dyslexia Association (2010). Dyscalculia, dyslexia and maths. Retrieved on 2nd June, 2016, http//www.bdadyslexia.org.uk/aboutdyslexia/schoolcolleges and universities/dyscalculia.html.

Broach, L. (2010) Learning Disabilities and Psychological Problems: In Overview Http//www.great school.net Retrieval on 20th July, 2016

Butter Worth B. (2013) Dyscalculia Screener. Republished London. Nfernelson Dyscalculia.com.htt//www.dyscalculie.com/dlbin/dyscalculiascience manual Pdf

Carew J.R (2010) Attention Deficit Hyperactive Disorder: System effects and counseling strategies (ed) in learning Difficulty and the Nigerian Child. The Nigerian society for educational Psychologists.

Charles M. A. (2009). Simplified Approach to Educational Research Snaap Press Ltd Enugu.

DFES (2001). The National Numeracy Strategy: Guidance to Support Children with Dyslexia and Dyscalculia. London: DEFES.

Division of Students Support Service (2003): Definition of Learning Disability Retrieved on 20th July, 2016 from http//:www.ed/gov/ca/edu/org/pdf/definition/fulpdf/

Ediger and Rao (2011) Essays on Teaching Mathematics. Discovery Publishing House, India

Fletcher, J. (2007). Learning Disabilities from Identification to Intervention New York Guilford Print

FRN (2015). National Policy on Education. NERDC Press-Nigeria

Henderson A, (2012) Dyslexia, Dyscalculia and Mathematics: A Practice Guidance. London Routledge.

Inclusive Education (2009)Learning difficulties among children. Retrieved on 26/12/15 from http//:www.dygraphiafoundation.org.uk.services/.php

Inekwe O. I (2019). Algebraic and Geometric reasoning Difficulties Affecting Remediation at the secondary level. Journal of Sokoto Educational Review 4(1), 83-93.

Jane Nyambura Munene, Kimiti R. Peter, Njoka (2017) Department of Educational Administration, Karatina University Corresponding Author: Jane Nyambura Munene,

Jordan, N. and Laurie, B.H. (2000). Mathematical Thinking in Second Grade Children with different form of Disabilities. Journal of learning disabilities 2a(1) 7-16

Kaufman L (2003)evaluation of numeracy intervention Programme focusing on basic numerical knowledge and conceptual knowledge. Jornal of learning difficulties.

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Kolawale, S.O. (2010). Children Learning Difficulties on overview. Nigeria Society for Educational Psychology.

Mehe-Madrona, L. (2008). In Allenton Deficit Hyperactivity Disorder in Children (ed) in Crew (2010) Allenton Deficit Hyperactivity Disorder Symptoms, Effects and Counselling Strategies, NSEP

Merck M (2019), Attention deficit disorder/hyperactive disorder. Online medical library. Retrieved on 2/2/15 from http:www.merck.com

Musa A K (2010) Understanding Specific learning difficulties: implication for classroom practice.

National Literacy news (2000) Macmillan Publishing company.

Nfernelson Publishing (n.d) Dyscalculia: Key Factor for Parents. Http//www.mathematical brain.com/pdf NFER.pdf

Nolasce R. and Arthur L., (1990). Large classes Macmilliam Publishers Ltd.

NTT, (2010) Integrated Training Manual for the retraining of primary school Teachers. Mathematics MDG's Prohect. NTT, Kaduna.

Obida J.A. (2010) Dyselexia in children: causes types and symptoms (ed) in Ref. 2.

Odili G. A. (2006). Mathematics in Nigeria Secondary. A Teaching perspective, Rex Charles and Patrick Li, in Associaiton with Anachuna Edarid books.

Peer L. and Reid G. (2016). Special Educational Needs. A Guide for inclusive practice.

Rao, D.B. and Latha, D.P. (2012) Achievement in Mathematics. Discovery Publishing House, India

Reddy, A. and Ramer (2014). Diagnosing Children with Learning Disabilities. DPAL India

Schnizta, P. K (2021) psychological Testing Microsoft Encarta 2007 (DVD) Redmond W. A. Microsoft Cooperation.

Sharma M, (2014). Diagnosis and Remediation of Math problems K-4 General workshop. Retrieved on 6th Feb, 2017 from http://www.lapdavl.org.

Yasoda J.A. (2013) Problems in teaching and learning Mathematics Discovery House Pvl ltd. India.

Yushau M. A. (2014). Diagnosing and Remediating mathematics learning difficulties of senior secondary school in Sokoto State unpublished M.Ed dissertation UDUS.

Yushau M.A Galadima I. (2019) Accommodating the special needs students in Mathematics Classroom Paper Delivered at the Annual National Conference. Math Nigeria.

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