AWARENESS OF DYSCALCULIA AMONG THE ELEMENTARY SCHOOL TEACHERS

A

DISSERTATION

Submitted to

BARKATULLAH UNIVERSITY, BHOPAL

In Partial fulfillment of the requirement for the degree of

MASTER OF EDUCATION

SESSION: 2011-2012

GUIDE

Mr. Anand Valmiki
-Assistant Professor,
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M. Ed. (RIE)

Regional Institute of Education
(National Council of Educational Research and Training)
Shyamla hills, Bhopal - 462013, (M.P.)

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NCERT

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DECLARATION

I do hereby declare that the dissertation entitled "Awareness of Dyscalculia among the Elementary School Teachers" has been carried out by me during the academic year 2011-2012 in partial fulfillment of the requirement for the Master Degree of Education (M.Ed.) of Barkatullah University, Bhopal.

This study has been conducted under the guidance and supervision of **Mr. Anand Valmiki**, Assistant Professor, RIE, Bhopal and co-guide **Dr. C. Siva Sankar**, Assistant Professor, RIE, Bhopal.

I also declare that this dissertation has not been submitted before either by me or by anybody else for the award of any other degree, in any university.

Place: Bhopal

Date: 10/04/2012.

Baliram Sahu

M.Ed. (RIE)
RIE, Bhopal

CERTIFICATE

This is to certify that ***Mr. Baliram Sahu*** *a student of M.Ed. (RIE) course in the year 2011-12 of Regional Institute of Education NCERT, Bhopal has worked under my guidance and supervision for his dissertation titled* ***"Awareness of Dyscalculia among the Elementary School Teachers"*** *I further certify that this work is original and worthy of presentation in partial fulfillment of the requirement of Degree of Master of Education of Barkatullah University, Bhopal (M.P.).*

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Place: Bhopal

Date: 10/04/2018

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CHAPTER-I

INTRODUCTION

CHAPTER I

INTRODUCTION

1.1. Introduction

Generally, human life is associated with the calculations. Without applying four fundamental operations, he or she can't manage economical events successfully. It is a estimated that 6-7% of world population has been suffering from difficulties in calculations (Early Childhood Learning Center 2010). This kind of difficulty is termed as dyscalculia. Dyscalculia also means number blindness. It is a part of specific learning disability. Dyscalculic learners may have difficulties in understanding simple number concepts and applying four fundamental operations (+, -, x, ÷). In school education, the most of children are unable to calculate prices and they are unable to read clock and tell time. They have sequential, special, directional and numerical difficulties because of many causes like genetic disorders, neurological disorders, long term and short term memory, lack of motivation, mental retardation, mathematical phobia, social factors, scholastic factors and environmental factors.

There are different types of dyscalculic children in classroom situations. Some of them have problems in naming the things (Verbal Dyscalculia), some of them have problem in reading mathematical symbols (Lexical Dyscalculia), some of them have problem in writing mathematical symbols (Graphical Dyscalculia) and some of them have problem in manipulating things (Practogonostic Dyscalculia). These children need intervention to overcome dyscalculia. Teacher is a pivot for preventing these sorts of the dyscalculia among children. He/she has to teach children with certain strategies like repeated reinforcement, employing visuals, providing extra time, teaching through concrete materials using templates, making joyful mathematical games and co-operative teaching. For implementing

these strategies, basically teacher needs awareness on dyscalculia relating to its concept, characteristics, symptoms, causes, types and other related aspects.

1.2. History related to the concept of learning disability

The concept of learning disability remained hidden of centuries. It did exit but was not recognized. However it is possible to look back and trace it multiple origins. The initial work in this area was done by Franz Jooseph Gall, a Viennese physician. Galll in 1802 related certain brain parts to specific tasks performed by individuals. Gall had worked with adults who had brain injuries. Resulting from a variety of causes. He observed patients who, after a brain injury, were unable to express feelings and ideas are spoken language. In 1895, James Hinshelwood, Scottish ophthalmologist published a report on visual perceptual problem, which he formed word blindness. Two British investigators, James Kerr and Morgan (1896) also reported cases of persons with severe reading problem (now commonly known as Dyslexia) despite normal intelligence.

In the year 1893, only deaf and blind were considered as glaringly handicapped. But by 1899, four categories of children were recognized- blind, deaf, physically and mentally handicap. In 1927, five categories were recognized .the fifth one was of epileptic children. The special educationists concentrated on the expansion of educational programmers for the children who were suffering from visual impairment, hearing impairment, mental retardation, orthopedic disability, emotional disturbance, speech defects, but besides all these categories, later it was observed that there remained a category which is not physically, mentally, emotionally disabled but failed to progress in the academic skills at the expected rate. Heinz Warner, Alfred A Straus and their associates perceived the need to make a separate category. The subjects of this new category were given various names.

The term learning disabilities Since 1963, this term learning disability has become the most acceptable for educational purpose as it emphasizes on the educational characteristics of such disorders.

Based on 19th and 28th national survey statistics the programmed of action provide number of disabled persons. Out of twelve million disabled person 4.3 million comprises UPE age group. To this may be added 1.4 million children in the earlier age group, which have relevance for early identification and preparation for education.

1.3 Meaning of Learning Disability

A number of definitions have evolved over time to define learning disability. According to the latest federal guidelines implemented under the individual with disabilities education act, specific learning disabilities means " a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, the may manifest itself in imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations. The term includes such conditions as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia and development aphasia. The term does not apply to children who have learning problems that are primarily the result of visual, hearing, or motor disabilities, of mental retardation of emotional disturbance or of environmental, cultural or economic disadvantage".

Education has always been meant for the students. But while education the students emphasis has always been on the curriculum, on school and its management but not on the students. In the view of the fact that student id the center of all learning activities: what is more important is how student learns, how he exercise the power of mind and body, how he thinks and understand. Much of child's learning in school and in later life depends upon his competency to use basic abilities such as thinking, reasoning, memory, imagination and perception motor abilities. These are needed for acquiring

basic academic skills such as reading, writing, spelling and arithmetic. Millions of children are not able to develop these academic skills adequately and face various educational deficits referred to as Learning Disabilities.

From educational point of view, the failure of a capable child to cope up rigid academic standards in school leads to a large number of failure and dropouts, hence to wastage of educational resources and unfulfillment of our important goal of education i.e. universalization of Elementary education.

The important aspect of education at primary stage viz; reading with understanding should be emphasized. If proper foundation for this is not laid at this level, the entire future education of the child will receive an irreparable setback. Many teachers generally try to teach reading in a thumb rule manner. It is the neglect of this crucial area that is responsible for a good deal of stagnation at primary stage. Disability in calculation has been referred as dyscalculia, when the child is otherwise intelligent.

1.4 Types of Learning Disabilities

There are two types of Learning Disabilities

1) Developmental Learning Disabilities

2) Academic Learning Disabilities

Developmental Learning disabilities are of two types

1) Primary developmental Learning disabilities.

2) Secondary developmental Learning disabilities

Primary developmental Learning disabilities includes perceptual deficit, Memory deficit and attention deficit. Secondary developmental learning disabilities include thinking disorders and language disorders.

Academic Learning Disabilities are of three types

Dyslexia

Dysgraphia

Dyscalculia

1.5 Concept of Dyscalculia

Dyscalculia or mathematical learning disability is specific learning disability which affects around 6% of population. Individual with dyscalculia are not unintelligent but struggle to learn mathematics, despite having an adequate learning environment at home and school. Dyscalculia is assumed to be due to a difference in brain function.

Dyscalculia affects individual over their life span, children with dyscalculia full behind early in primary school and may developing anxiety or strong dislike of maths (Anna Wilson, 2008). International dyscalculia forum has declared that March 3rd as world dyscalculia day from 2008.

1.5.1 Etymological meaning of Dyscalculia

The term dyscalculia originates from "dys" which means "difficulty or poor" in Greek and "calculia" means difficulty with calculation thus dyscalculia is a learning disability involving mathematics. This disorder is like or it is also known as mathematics dyslexia suffers find it extremely difficult to calculate variables, recognize number, and count objects.

These children have normal IQ levels and everything else is normal including their reading, writing and speaking skills. Scientists have yet to find a definitive cause for this disorder, although there is some speculation that certain genetic anomalies, such as Fragile X syndrome or environment causes

such as in-utro exposure to alcohol, could play a role in developing dyscalculia. Someone who suffers from dyscalculia has difficulties to learn -

Arithmetical concepts

Arithmetical procedure

This difficulties have no relationship with sufficient educational experience dyscalculia should be identified since the beginning otherwise it will bring anxiety and low self esteem to the sufferers due to inability to deal with maths lessons.

1.5.2 Meaning of Dyscalculia

Dyscalculia is form of dyslexia. Dyscalculia is rather where dyslexia was about thirty years ago. There is a lot of debate about whether dyscalculia exists as a separate condition. Dyslexia can affect maths but many dyslexics are very good conceptually at maths but can't learn the number facts –that is not dyscalculia. Dyscalculia is quite a serious (and thankfully quit rare) persistent congenital condition and dyscalculics don't really have a basic feel for number. This is very different from a dyslexic who's poor at math's. In the past dyscalculia was known as number blindness which is a little simplistic it is more accurate to say dyscalculics don't an intuitive feel for number. This means they don't have a natural feel for quantities, a dyscalculic child may be able to count 1,2,3,4,5..... But they do not really have the sense of the fiveness of five or the fact that an egg box always has six spaces for the six eggs.

Common learning disabilities are: Dyslexia is a language based disability in which a person has trouble understanding word, sentences or paragraphs. Dyscalculia is a mathematical disability in which a person has a difficulty in which a person has difficult time solving arithmetic problems and grasping math concepts. Dysgraphia is a writing disability in which a person

finds it hard to form letters or write within a defined space. Auditory and Visual Processing Disabilities are processing/sensory disabilities in which a person has difficulty understanding language despite normal hearing and vision. Dyscalculia is a learning disability in which a person has difficulty using numbers, or mathematical symbols and concepts.

Dyscalculia is a term used to refer to learning disabilities that involve arithmetic comprehension or computation. This difficulty in mastering concepts or computations is usually associated with neurological dysfunction or brain damage and is classified as developmental (occurring before birth from genetic or congenital problems) or acquired (occurring after birth usually from a traumatic brain injury). To be classified with dyscalculia, a child must have intellectual functioning that falls within or above the normal range and a significant discrepancy between his/her age and math skills (usually 2 years or more). For a child to be diagnosed with dyscalculia, it is important to make sure his math deficits are not related to issues like inadequate instruction, cultural differences, mental retardation, physical illness or problems with vision or hearing

1.5.3 Types of Dyscalculia

Dyscalculia, which means inability to calculate, is the most widely used term for disabilities in arithmetic and mathematics.

According to the website dyslexia in Ireland dyscalculia can be broken down into three sub type-

1. Quantitative dyscalculia- A deficit in the skill of counting and calculating.

2. Qualitative dyscalculia- A result of difficulties in comprehension of instructions or the failure to master the skills required for an operation. When a child has not mastered the memorization of number facts, he cannot benefit from this stored "verbalization information about numbers" that is used with

prior associations to solve problems involving addition, subtraction, multiplications, division and square roots.

3. Intermediate dyscalculia- Involves the inability to operate with Symbols or number.

On the basis of Kosc experience with arithmetic learning problem Kosc describe Dyscalculia types:

1. Verbal dyscalculia- Verbal dyscalculia involves a difficulty with talking about mathematical concepts or relationships. For instance, a person with verbal dyscalculia may be able to read and write numbers, but unable to talk about them, remember their names or recognize them when they're spoken by others.
2. Practognostic dyscalculia- Which refers to problem in manipulating thing mathematically. For example-comparing object to determine which is larger. People with practognostic dyscalculia have difficulty translating their abstract mathematical knowledge into real-world actions or procedure. They are able to understand mathematical concepts, but they have difficulty working with actual quantities, volumes or equations in a practical way.
3. Sequential dyscalculia- These disorder make it difficult for the disabled to count numbers in a sequence additionally, he/she also may have a problem with time calculation, schedule check, direction tracking and measurement taking.
4. Developmental dyscalculia- Children facing this find it difficult to count and recognize mathematical sign (+, -, x), symbols reading.
5. Operational dyscalculia- Operational dyscalculia is a difficulty with performing mathematical operations or calculation. A person with operational dyscalculia can understand numbers and their relationship to one another, but finds it hard to do any kind of calculation that requires manipulating numbers and mathematical symbols. This problem is associated with remembering or

memorizing maths rules and also refers to problem in performing arithmetic operations.

6. Graphical Dyscalculia- Graphical dyscalculia causes difficulties with writing mathematical symbols, including but not limited to numbers. A person with this disability can understand mathematical ideas when talking about them, and can read mathematical information, but has trouble writing or using math symbols to convey this understanding

1.5.4 Characteristics of dyscalculia

Dyscalculia is a learning disorder in which individuals struggle to understand mathematical concept and problems. This problem can be a difficult one to identify, particularly if teachers are not looking for it; some children with dyscalcuia can be dismissed as simply being poor students or not making the effort to learning their math problems. In order to provide the needed help, though, children heed to be identified as having dyscalculia. In order to do this, parents and teachers need to be on the lookout for the common symptoms of this learning disorder and evaluate the student's struggles.

Dyscalculia is a lesser-known learning disability that can affect a person with any degree of mathematics difficulty. The underlying causes of the disability involve problems with visually processing math number and situations, as well as difficulty with sequencing information in an organized manner. The symptoms of dyscalculia can be observed as difficulty with mathematical word problems. Troubles using a calculator, doing operations backward and making mistakes when reading, writing, or recalling numbers.

*Time and direction difficulties-

A person suffering from dyscalculia may often be late for appointments or events and may have problem remembering schedules. they may also find it difficult to estimate how long a task will take a complete and dyscalculia suffer may be easily disoriented and have little or no sense of direction.

*Disparity between Verbal and Mathematical abilities.

Some time with dyscalculia may have excellent speaking and writing skill and still be unable to do even simple maths problem solving tasks.

*Money handling difficulties.

Keeping track of cash or a maintaining a bank account balance may require intense effort or outside assistance.

*Sequential directions difficulties

It may be difficult for a person with dyscalculia to keep sequence of direction in order. In problem requiring the use of mathematics, he may confuse the order of addition, subtraction, multiplication or division.

*Disparity between mathematical concepts and specific problem.

A suffer of dyscalculia may have a good understanding of general mathematical concepts but when it comes to specific computational methods and/or organizational skills, he may be lost.

*Difficulties at school-

Dyscalculia can be recognized early on in a child's educations as they present with setbacks in math class. With this learning disability, kids can be slow to learn counting and have problems early on with basic math skills such as addition, subtraction. Division and multiplication. Memorizing or grasping concepts of math, rules, proper sequencing, or formulas is challenging for someone with dyscalculia.

*Problem outside of the class-

For an individual with dyscalculia, math problems can affect aspects of life outside the classroom. The inability to approximate time can cause them to be chronically late, and a poor sense of direction can cause them to get easily lost and confused, according to the National Center for Learning Disabilities. Dyscalculia also can causes trouble with personal finance due to poor abilities with handling cash, credit and calculation of change, tips or taxes. Keeping score, or remembering whose turn it is during games can be challenging, and there is often a considerable lack of strategy sills, which are needed for games such as chess. Other symptoms include facing obstacles regarding music educational and athletic coordination.

*Difficulties at school

Although mathematical skills are an impediment, those with dyscalculia often excel in other areas, particularly linguistics. The ability for spoken language, writing and reading materials other than math is not affected by the learning disability. Although memory fails when it comes to numbers, remembering printed words is not difficult at all for these individuals. Perhaps calculus is no a forte of a person with dyscalculia, but science, geometry and the creative arts are areas where their talents can definitely unravel.

1.5.5 Symptoms of Dyscalculia

(The symptoms of dyscalculia include difficult in)

- Classifying mathematical signs (+, -, x, ÷)
- Reading a clock and telling time.
- Calculating basic amounts like bills.
- Learning multiplication tables.
- Using calculators.
- Reading a personal schedule.

- Learning and remembering mathematical rules and formulas.
- Keeping records.

1.5.6 Causes of Dyscalculia

Scientists have yet to understand the causes of dyscalculia. They have been investigating in several domains.

- Neurological: Dyscalculia has been associated with lesions to the supramarginal and angular gyri at the junction between the temporal and parietal lobes of the cerebral cortex.

- Deficits in working memory: Adams and Hitch argue that working memory is a major factor in mental addition. From this base, Geary conducted a study that suggested there was a working memory deficit for those who suffered from dyscalculia. However, working memory problems are confounded with general learning difficulties, thus Geary's findings may not be specific to dyscalculia but rather may reflect a greater learning deficit.

Other causes may be:

Short term memory being disturbed or reduced, making it difficult to remember calculations.

Congenital or hereditary disorders. Studies show indications of this, but the evidence is not yet concrete.

Gerstmann syndrome: dyscalculia is one of a constellation of symptoms acquired after damage to the angular gyrus.

Involvement of the intraparietal sulcus has been suggested.

1.5.7 Assessment for Dyscalculia

According to the American Academy of child and Adolescent Psychiatry, learning disabilities such as dyscalculia affect at least one in 10 school-aged children. Difficulties in learning are associated with the nervous system not receiving, processing or communicating information in a normal fashion. Dyscalculia is a disorder of learning mathematics, which can affect a wide range of information processing such as spatial relationship, remembering numbers or facts and sequencing of steps. Dyscalculia affects individuals differently because math disabilities often vary.

Initial Evaluation:

The initial evaluation process determines the presence of a learning disability. According to the Learning Disabilities Association of America, professional evaluation facilitates identification of the learning problem as well as prompts planning of special needs for ongoing education. Formal and informal testing to measure mathematical performance occurs after the child is deemed as having a problem with learning arithmetic. Since the forms of dyscalculia vary, this often requires several screenings or tests to find the specific area of numerical deficiency the child struggles with.

WISC-III

The Wechsler Intelligence Scale for Children or WISC-III is an individual test given to children between ages 6 and 16, orally and without time limit, except during the mathematical portion. The mathematical portion has several application areas being tested. The sections of this test include verbally framed math applications, repeating dictated digits in a series in order of instruction such as forward or backward, and block design, which includes copying small geometric designs. A coding portion of this test measures recognition of shapes and transcribing digit-symbols as quickly as possible in a time limited fashion. Overall intelligence is measured by the full WISC-III test.

WJ III

The Woodcock Johnson III, or WJ III, is a test for all ages over 2 years old. It tests overall academic achievement and includes brief testing for mathematical ability. Fairlegh Dickinson University describes the math portions of the test as involving computations, timed calculations, oral word problems and questions about factual at information or operations. The overall test focuses on cognitive ability and dyscalculia is diagnosed when a discrepancy between the math portion of the test is below that of the overall cognitive achievement scored on the test.

Dyscalculia Screener

The Dyscalculia Screener is a newer standardized and computer based test developed to diagnose children between the ages of 6 and14. According to the 2007 review in the "British Society for Research into Learning Mathematics" this test is used solely to distinguish dyscalculia from any other condition that affects performance. The Dyscalculia Screener identifies deficiencies in numerical tasks through measuring reaction time, number comparisons and use of addition and multiplication achievements.

1.5.8 Strategies for Dyscalculia

Dyscalculia is a term used to describe learning disabilities that specifically affect numeric skills. According to teaching expertise, an online resource for teachers, approximately 5 percent of all children have some form of dyscalculia. There are May different types of math disabilities that are considered to be dyscalculia, though underlying causes vary. Whatever the causes of the learning problem, there are several strategies to help overcome dyscalculia.

Dyscalculia is a life-long condition that can be treated with special education services steered by initially identifying the strengths and

weaknesses of a student to help them achieve academic success. And while there is no cure, steps can be taken to lessen its impact on the victim. According to the National Centre for Learning Disabilities, the use of tools like graph paper to organize ideas and numbers, alternative approaches to math problems, and eliminating distractions all have proven to be effective ways of dealing with the disorder. Strategies to help children with dyscalculia learn math break down the seemingly impossible barriers so your child can understand and do basic math.

Visual strategies-Visual strategies, such as encouraging the dyscalculia student to draw diagrams, pictures, or use a physical object, can help the student visualize numbers more easily. The key is to teach the student how to conceptualize a real-life situation and associate it to the numeral problem, in turn, making it mentally "real" to them. The student can pick a favourite theme or idea, associate numbers to these concepts and apply it to a drawing or a student can arrange objects that represent the numbers and create calculations with them; the abacus was once used for this same strategy.

Verbal strategies: such as turning a figurative math problem into an abstract one, using words, is also a great way for a student with dyscalculia to conceptualize. For instance, the student can verbally say the numeral problem by creating a word problem out of it.

Sequence Strategies: Organization is a key concept when developing classroom strategies for students with dyscalculia. For instance, horizontal mathematical calculations may be difficult for a dyscalculia student, because the sequence of numbers are calculated vertically from top to bottom, whereas reading sentences are done horizontally, from left to right. It may help a dyscalculia student if math problems were written in a linear sequence. Another strategy is for the students with dyscalculia to perform mathematical problems on graph paper, in order to keep the numbers in the correct sequences. Confusion can create a mental shut down in a dyscalculia student, and keeping an organized and clutter free math worksheet or homework

paper, can help the student avoid these pitfalls. Often when problems are written too closely together, a dyscalculia student may become confused and frustrated.

Extra time: A child with dyscalculia can learn math, but may require additional time and instruction in which to do so. The Learning Disabilities Association of America suggests peer tutoring for kids who show signs of this learning disability. A student of the same age and peer group may be able to explain math concepts to a child with dyscalculia in a way that wouldn't necessarily occur to a teacher. Peers working together might be less frustrating or stress-inducing for your child than working with an adult tutor, although if peer tutoring is not effective enough in getting your child to understand math, an experienced teacher may be an option to consider.

Creative problem solving: Strategies that seem simple to the average person can make a world of difference to those who suffer from dyscalculia. Symptoms of the disability involve a decreased capacity for understanding math concepts and a poor sense of layout and organizational skills when setting up problems. L. D. Online explains that giving your child additional supplies with which to tackle his math can help, such as graph paper and colour pencils. The confines of the small boxes on graph paper might help your child structure his problems in a way that is easier for him to see, and colour pencils can aid in keeping mathematical operations, or even complete math problems separate from each other.

Use Graph Paper: Some students who suffer from dyscalculia will have problems with visual spatial relationship. That means that they have difficulty relating one object to another, which in math translates to difficulty relating one number to another. This is most often noticed when the student cannot align numbers in columns or when calculations overlap on paper, according to

Child.org. For these students, it may be helpful to use graph paper which provides clear columns to help in organizing the numbers.

Repeated Reinforcement: One of the best ways to overcome dyscalculia is trough repeated reinforcement. The student, along with a teacher, parent or tutor, should focus on the pacific difficulty. This helps the student master the basics before moving on to new concepts. By removing the pressure of new material, a potentially negative feeling toward math can be changed to a positive experience.

Encourage Questions: As with any type of learning disability or any learning situation in general, always encourages the student to ask question. This especially helpful to those whose dyscalculia is caused by language difficulties. Asking question can help reinforce idea and provide additional explanation to help visualize the problem.

1.6 NEED & SIGNIFICANCE OF THE STUDY

Children's with specific learning disability (SLD) are unable to achieve school grades at a level that is commensurate with their intelligence. Specific learning disability may include dyslexia, dysgraphiya, dyspraxia, and dyscalculia. Among them, dyscalculia is a neurological disorder which affects the children's ability in doing calculations. Children have been suffering from numerical inabilities (dyscalculia). Many of studies conducted on dyscalculia which is related to causes, strategies and developmental dyscalculia.

Mathematics is an important discipline for school children at primary level. It paves way for improving reasoning and logical thinking. It is base for intuitively knowledge and insightful ideas. Through Mathematics one can develop rational, critical and reflective thoughts. It is root for scientific inquiry (Wilson,2008 & Mazzocco 2005). But most of the children at primary level, have been facing difficulties with mathematics. This may be due to

math anxiety, tear, tension, neurological disordered, brain dysfunction, foetel disorder, hereditary factor, lack of motivation and interest in mathematics (Badian,1999 & Ashcraft 2002).

Kosc (1974), Gilman &Tomey (2003), Landral et.al.(2009) adds that dyscalculia is a complex & multi causal disability. Fusseneggr, Mollard & willburger (2009) have reported that dyscalculia is a separate cognitive profile which effects mathematical ability. Emerson, Jane & bubtie & Patricia (2010) have reviewed that sequential difficulties and working memory difficulties cause dyscalculia among children. Bultorworth, Varma, laurillard (2011) have reported that remedial instruction is one of the ways for helping dyscalculics.

Jordan, Kaplan and Haricl (2002), Revet, szelcely and Hockenberry (1994), Paterson, Butterworth and karmilob smith (2001), Richardson and suinn(1972), Bevan and Butterworth (1994), Shalevard Gras-Tsur (1996), Lerner and Khine (1999), Farmin, Riddck and Starling (2000), Lotic Kaliki (1967), Flectcher (2006),Sandra, Merrilym and Sparrow (2006), Vasanti and Bamalulithombika (1997), Sing Ahluwalia and Verma(1996), Chandrakant Bhogoyata and Navnit Rathod (1989), Patel (1991), Antony stella and Purushotamm(1995), Shehapur, Dorainwamg and Vakotocl (1995), Praveen Joshi (1993) , Jhomar (1984), Rajendra Tushare(1980), Singh and Verma (1992), Shesha giri rao (1981), Pagliaro (1997), Michad Beven Kopf (1975), Webster and Webster (1979) have done researches on dyscalculia in order to give awareness to teachers to deal children with dyscalculia. Geary and Hoard (2001), Shalev (2001) have reported that mathematical difficulty can be referred as dyscalculia. They also suggested that the teachers must have awareness on dyscalculia.

From the researches, it is evident that dyscalculia is a significant problem in children in and out of the classroom situations. The teachers must take vital role in dealing children with dyscalculia. For this, they need awareness regarding concept of dyscalculia, its symptoms, types and causes. By having awareness on these aspects, they can follow certain strategies for dealing

children with dyscalculia effectively. There are ample of researches on awareness of dyscalculia abroad, but few researches in connection with awareness of dyscalculia were done in India. Hence, the present investigator keeping in view of the significance of the awareness of teachers on dyscalculia, he has been thought of conducting research on awareness of dyscalculia among elementary school teachers. Hence, he started the problem as given below.

1.7 Statement of the Problem

"Awareness of Dyscalculia among the Elementary School Teachers"

1.8 Operational Definition

Awareness:-

According to Oxford Advanced Learning Dictionary (1996), Awareness is noun from of Aware. It is knowledge of realizing fully aware of.

Dyscalculia:-

According to Wikipedia (2009), "Dyscalculia is specific learning disability involving in a difficulty in learning and comprehending in simple arithmetic"

According to Early Childhood Learning Knowledge Center (2008), "Dyscalculia refers to a persistent difficulty in learning or understanding concept o related to numbers, counting and arithmetic"

In the present study, Dyscalculia is connected with difficulties in calculations.

Awareness of Dyscalculia – It is knowledge of a person related to persistent difficulty in learning or understanding the concept related to difficulties in calculation.

Teacher:-

In the present study, teacher is one who teaches at elementary level and has been dealing children with dyscalculia.

1.9 Objectives of the Study-

1. To find out the levels of awareness of dyscalculia among elementary school teachers.
2. To find out the significant differences if any, in awareness of dyscalculia among elementary school teachers with regard to gender.
3. To find out the significant differences if any, in awareness of dyscalculia among elementary school teachers with regard to age.
4. To find out the significant differences if any, in awareness of dyscalculia among elementary school teachers with regard to management.
5. To find out the significant differences if any, in awareness of dyscalculia among elementary school teachers with regard to teaching experience.

1.10 Hypotheses of the study -

1. There is no significant difference in awareness of dyscalculia among elementary school teachers with regard to gender.
2. There is no significant difference in awareness of dyscalculia among elementary school teachers with regard to age.

3. There is no significant difference in awareness of dyscalculia among elementary school teachers with regard to management.
4. There is no significant difference in awareness of dyscalculia among elementary school teachers with regard to teaching experience.

1.11 Delimitations of the study-

1) The Study is limited to sample of 100 Teachers. Working at elementary level.
2) The study is limited to area located in Amla block at Betul district in M.P.
3) The study is limited to Single dependent variable, namely Awareness.
4) The study is limited to four Independent variables- Gender, Age, Management and Teaching Experience.

CHAPTER-II

REVIEW

OF

RELATED LITERATURE

CHAPTER II

REVIEW OF RELATED LITERATURE

2.1 Introduction

The review of the literature in educational research provides in with the means of getting the frontier in our particular field of knowledge. Until we have learned what other has done and what remains till to be done in our area we cannot develop a research design that will contribute to further knowledge in our field. This, the literature in any field from the foundation upon which all further work is likely to be often duplicate work that has already been done better by someone else. We however should make every effort to complete a thorough review before starting our research because the insight and knowledge gained by the review almost inevitably lead to a better designed research and greatly improve chance of obtaining important and sufficient result.

A careful review of literature makes researcher aware of unimportant variables in the concerned area of research. It helps in selecting the variables lying within the scope of his/her field. Prior study serves as the foundation for the present study through review of the literature, a researcher builds up better perspective for future research. A caution review of the literature enables the researcher to collect and synthesize prior study related to present study.

Good, Barr and Scates (1941) analysed the purpose of review of related literature as given under;

1) To show whether the evidence already available solves the problem adequately without further investigation and thus to avoid the risk of duplication.
2) To provide ideas, theories, explanations or hypotheses valuable in formulating the problem.
3) To suggest methods of research appropriate to the problem.

4) To locate comparative data useful in the interpretation of results.
5) To contribute to the general scholarship of the investigator.

2.2 Importance of Review of Related Literature-

Review of the related literature, besides allowing the researcher to help himself/herself with current knowledge in the field or area. In which he/she is going to conduct his/her research serves the following specific purpose-

1) The review of related literature enables the researcher to define the limits of his/her field.
2) By reviewing the related literature the researcher can avoid unfruitful and useless areas.
3) Through the review of related literature the researcher can avoid unintentional duplication of well establishment findings.
4) The review of related literature gives the researcher an understanding of the research methodology, which refers to the way the study to be conducted.
5) Locating data for making comparisons and interpretation.
6) The final and important specific reason for reviewing the related literature is to know about the recommendations of previous researchers listed in their studies for further research.

2.3 Study related to Dyscalculia

Some of the researches have mentioned below which are related to present study-

Kosc (1974) has explained different forms of dyscalculia. They are: i) Verbal dyscalculia indicate difficulties in remembering and naming mathematical terms and symbols. ii) Practognostic dyscalculia indicates difficulties using

manipulative or pictures when applying mathematical concept. iii) Graphical dyscalculia indicates problems with writing mathematical terms and symbols. iv) Lexical dyscalculia indicates problems with reading the vocabulary and symbols of Mathematics. v) Operational dyscalculia indicates difficulties with mathematical operations such as addition, subtractions, multi9plication and division. vi) Ideagnostical dyscalculia indicates difficulties with mathematical ideas or concepts. He introduced the term "developmental dyscalculia" in his publication regarding specific deficits in learning about numbers.

Badian and Ghublikian (1976) compared the social/ emotional characteristics of youngsters who had poor mathematical computation skills but were average in reading with students who were below average in reading but average in Math's, and with pupils who were average in both skills. Data showed that the children who were poor in mathematical computation and average in reading rated significantly lower on a personal-social behavior scale than did youngsters in the other groups.

Desai (1988) has conducted a study on Learning disability of Primary school children. The objective of the study was: Apathy of teacher for certain children destroys there incentive to learn and to investigate their probable cause. Parental disregarded of the studies of their children is a major factor affecting disability in Learning. The sample of the study was three private school and three municipal schools from Navrangpur and one class of grade IV from each of the six schools were selected. 270 children were selected for study. He has used Draw-a –man test and Arithmetic test were prepared and administrate. Interview of Teacher and Parents were held. ANOVA was applied for analyses. The major of study was: the cause of the malady was the apathy of Teacher's to their duties in school and Low intelligence was also one cause of the malady.

Ramma (1990) has conducted Study on neuropsychology process and logico-mathematical structure among the dyscalculics. The objective of study is: To identify dyscalculic, who are free from dyslexia and dysgraphia from among children in primary school. And To find out whether there are sub categories within the group of dyscalculics who are normal in reading and writing in terms of the difficulties encountered by them while doing Arithmetic sum. The sample of the study is10 Primary school (Govt. and Private) were selected 15 student identified as dyscalculics based on diagnosis. She has used Arithmetic's diagnostic test. The finding of study are : Solving simple problem of addition and subtraction involving verbal and numerical relations appeared in fraction terminology and basic operations involving fraction and also in understanding and applying algorithms relation to different arithmetic process. Almost all dyscalculics of present study failed to solve problems involving spatial and numerical relation. Children with dyscalculia have more difficulties in multiplication

Mishra, (1991) has conducted the research on Development of teaching steps for handling arithmetic disabled children. The objective of study are: To developed an approach and specific steps I teaching subtraction and addition to the arithmetic disabled children. The sample of the study is 4 students (2 Boy and 2 Girl) sample was taken from a special institution meant for learning disabled children Bhuwneshwer. The purposive sampling was used. The finding of the study was With training and following the teaching step, the disabled subject, could perform in a better way. With respective training and more assessment, the subjects could improve in memory for a longer period.

Vasanthi, (1991) She conducted study on Mathematical learning disability in relation to certain psychological, Social and educational factors.the objective of the study was: to identify the various types of mathematical learning disability among the standard VII pupils. Psychological factor like intelligence, neuroticism and behavior problem. The sampleof the study was 1172 pupil of VII Class. She has applied Mathematical Learning Disability Test. The finding of study was: Mathematical Learning Disability had significant negative relation to intelligence and social economic status and positive relationship to behavior problem.

Shrivastava, Sushila & Afiah, (1992) have conducted a study on Learning Disability among elementary school children the Objectives of the Study was: (i) To identify the learning disabled (ii) To assess their ability in those aspects such as reading, writing among age, sex, and religion with reference to Learning disability among elementary school children. The sample of the study was150 Elementary school children (75 Boys and 75 Girls). They have used Compass Diagnostic Test in Arithmetic, Jones spelling scale standard scale for judging handwriting. They have applied mean, SD, t-test, ANOVA. The finding of study was Age had a significant influence on disability in Reading, Writing and Arithmetic. There was no significant difference between boys and girls in their disability in Reading and Arithmetic.

Gupta (1997) studied the incidence and nature of learning disability at the end of Class II in Language and Arithmetic and to envelope preventing strategies. with the objectives to investigate the incidence rate of children with learning disabilities and to develop diagnostic tests to study the nature of Learning disability in Hindi and Arithmetic. The major finding was: Almost all children display learning disability in Hindi in Arithmetic, children show deficiency in basic operations and yoga exercises were recommended for

children having attention, deficit, hyper activity, poor visual, spatial orientation and poor ground perception.

Bliss, (2000) pointed out that Mathematics learning disability does not often occur with clarity and simplicity. He also identified that mathematical learning difficulties could be combinations of difficulties which may include language processing problems, visual, spatial confusion, memory and sequence difficulties and unusually high anxiety. He suggested that specialized equipment, assistive technology and variations in the methods and materials of testing for adults are to be used.

Gadian & Isoac Edmonds (2001) made research on genetic and developmental disorder associated with dyscalculia such as Turner's syndrome, Foetal alcholo syndrome and Low Birth weight, they also reported that brain impairment is also one of the factors that leads to dyscalculia.

Farmer, Riddick and Sterling (2002) mention that some people with dyscalculia can perform basic Mathematical tasks but cannot apply these simple tasks to higher level Mathematics and cannot apply mathematical concepts to real life situations. There are different forms of dyscalculia namely, i) Verbal Dyscalculia ii) Practognositc Dyscalculia iii) Graphical Dyscalculia iv) Lexical Dyscalculia v) Operational Dyscalculia.

Munro (2003) has conducted a study on unifying concept in understanding mathematical learning disability. The Objective of this study was to identify types of developmental dyscalculia and to clarify the relationship between developmental dyscalculia and reading disabilities. A group of 80 children aged 9 to 13 was selected. The major finding was Individual display a

mathematics disabilities when their performance on standardized calculation test or on numerical reasoning tasks is comparatively low, given their age, education and intellectual reasoning ability. This research also suggests, there is at present little overlap between the study of developmental dyscalculia and math's education. Obviously the two areas would share knowledge. It has already been noted that some of the types of difficulty characteristic of Developmental Dyscalculia are displayed in as part of the regular development of mathematics knowledge.

Mazzocoo (2005) defines dyscalculia as a genetic, neurological disorder that affects an individual's ability to do Mathematics: A discrepancy exists between the individual's general cognitive level and ability to comprehend and do Mathematics. Mclean and Hitch (1999) used another terms "Specific arithmetic learning difficulties" instead of the word "Developmental dyscalculia".

Kulkarni, et.al.(2006) have studied on educational provisions and learning disability.The main objective of this study to assess the impact of the provisions of the Maharashtra Govt. on the academic performance of children with specific learning disability at the secondary school certificate board examination. The sample of the study was 60 children (45 Boys and 15 girls) at the SSC board examination with benefit of chosen provisions was compared with their performance at their last annual school examination before diagnosis of Special learning disability. The conclusion obtained from this study is that children with special learning disability who have availed the benefit of provisions showed a significant improvement their academic performance at the SSC board examination.

Landerl, et.al. (2009) have conducted the research on Dyslexia and Dyscalculia: Two learning disorders with different cognitive profiles. This study tests the hypothesis that dyslexia and dyscalculia are associated with two largely independent cognitive deficits. In four groups of 8-10 year olds (42 controls, 21 dyslexic, 20 dyscalculic and 26 dyslexic/dyscalculic) children's was selected for this study. The major finding was that children are having problem in processing of symbolic and non-symbolic magnitudes in both groups of dyscalculic children but not in dyslexia group.

Shalev,et.al. (2009) has conducted study on Developmental dyscalculia behavioral and attention aspects. The objective of this study was to check the dyscalculic children demonstrated more behavior problems than normal children and to check the significantly attentional problems among anxiety and depression. Behavioral characteristics of 140children with developmental dyscalculia were evaluated using the child behavior checklist. It is found that significantly higher scores on all syndrome scales are found for developmental dyscalculic children who have attentional problems in the clinical rang.

Sujatha, Mudundi & Shrikant Andhare (2011) have conducted the critical study of learning disabled student. The objective of study was to identify the learning disability of student and to get the information about various learning disabilities in this research they have selected descriptive survey method. The sample of the study is 117 students. They have applied achievement test and questionnaire for the teacher. The finding of the study was: learning disability need to be identified at std. IV to V by administrating achievement test and comprehension, grammar, mathematical problem, non-verbal disordered i.e. graphical skill are disorders among pupil.

Bhaman Sharma (2011) has conducted a study on awareness of RTE among the Govt. and private school teachers (male and female) the objective of the study of the study was to find out he awareness of RTE among government and private school teachers. The sample of the study was 78 teachers. He has used survey method. He has used self made questionnaire. The finding of the study was on the basis of mean the significant difference was seen between government and private school teacher. The private school teacher was more aware about RTE.

Siva Sankar & yashoda (2011) conducted a study on awareness of dyscalculia among primary school teachers. The main objective of the study was: To study the influence of age, management and locality on awareness of dyscalculia among primary school teachers. The main hypothesis of was: there exists no significant difference in awareness of dyscalculia with regard to influence of age, management and locality. The findings were:

1) Age has a significant influence on awareness of dyscalculia among primary teachers with regard to instructional strategies.
2) Management has a significant influence on awareness of primary teachers with regard to dyscalculia, limited to causes.
3) Locality has a significant influence on awareness of primary teacher with regard to dyscalculia limited to causes.

2.4 Conclusion

By observing the reviews, it is clear that there are very few researches were done on awareness of dyscalculia at school level. Hence, the investigator has thought of do research on awareness of dyscalculia among elementary school teachers. Keeping in view about the need of the study, the investigator has proposed objective, hypothesis, and variable of limitation of the study.

CHAPTER-III

METHODOLOGY

CHAPTER III

METHODOLOGY

3.1 INTRODUCTION

The methodology of research includes well designed research procedure and use of appropriate techniques. It not only makes the study scientifically sound and plausibly but also gives credibility to the findings.

It involves the systematic procedure by which the researcher starts from initial identification of the problem to its final conclusion. The role of methodology is to carry on the research work in valid manner.

The purpose of educational research cannot be completed without detailed design of investigation. Research methodology involves a systematic procedure which starts from identification of problem to analyzing the obtained data. This chapter deals with sample, variables, tool, data collection, analysis and statistical techniques used in the study.

3.2 SAMPLE

Data collection is essentially an important part of research process so that the inferences, hypotheses or generalization tentatively held, may be identified as valid, verified as correctness & rejected as untenable. In order to collect the requisite data for any research problem, the researcher has to sample to the population concerned since it is not possible to encompass the entire population to devise appropriate tools for measuring the attribute concerned and to administration these tool.

Sample is a portion of the population which represents the population wholly and truly. A good sample must be as nearly the representative of the entire population as possible and ideally it must provide the whole of the information about the population as from which the sample has been drawn.

Keeping the view of nature of the problem and population under investigation its availability, suitability and suitability time, Simple Random stratified Technique was used and 100 teachers (male and female) were selected for the present study those belonging to elementary school.

Table 3.1 Table showing of the sample with regard to variables:

VARIABLE	SUBVARIABLE	SAMPLE	TOTAL
GENDER	Male	50	100
	Female	50	
MANAGEMENT	Govt. (School)	50	100
	Private (School)	50	
AGE	Below 30 year	36	100
	30-40 year	37	
	Above 40 year	27	
TEACHING EXPERIENCE	Below 10 year	36	100
	10-20 year	37	
	Above 20 year	27	

3.3 Method

Data collection is very important part in any research. The researcher adopts a descriptive survey method to access the awareness of dyscalculia among the elementary school teachers. The researcher has a face to face interaction with the teachers. The rating scale was administered to the randomly selected teacher and later the responses were collected from them.

3.4 VARIABLES

Variables are attributes which exhibit difference in magnitude and which vary along certain dimension variables taken in.

According to Borg & Gall (1983) "A variable can be through of as a qualitative expression of the construct variable usually take the form of scores on a measuring instrument" Two types of variables are taken into consideration in this study they are Independent variables-

The independent variables are the conditions or characteristics that the researcher deliberately, manipulates and control to determine the events in which researcher is interested and its relationships to an observed phenomenon.

In the present study the independent variables are

i) Gender
ii) Age
iii) Management
iv) Teaching experience

Dependent variable-

The dependent variable is that factor which is observed and measured to determine the effects of independent variables i.e. the factor that appears, disappears or varies, as the experimenter introduces removes or varies the independent variable.

In the present study the dependent variable is- Awareness

3.5 Research Tool

A tool is appropriate for collection of certain types of evidence or is appropriate for collection of certain type of evidence or information.

A researcher requires many data gathering tools or techniques. Each tool is suitable for the collection of certain type of information. One has to select from the available tools these which will provide data he/she seeks for testing hypothesis.

In the present study, the tool used in the study is Rating scale of awareness of dyscalculia which is constructed and developed by Dr. Chintal Siva Sankar (2010).

The rating **scale** which is used in this present study is five point rating scale. There are 50 statements in this scale. The scale is divided into five dimensions which are related to concept, characteristics, causes, strategies and assessment. In this scale, there are five options i.e. SA (strongly agree), A (agree), UN (undecided), D (disagree) and SD (Strongly disagree).

The reliability of the Rating scale is 0.0905

The intrinsic validity is of the rating scale is 0.92

It also possesses face validity and content validity.

3.6 Administration of research tool

The administration of the tool followed by this procedure-After taking the permission letter of data collection from the head of the department. The researcher went to elementary school of the delimited area for the administration of tool. The tool was administered to the teachers by taking prior permission of the headmaster/headmistress. Before administrating the tool the teachers were given required instruction for filling up the rating scale.

After that each teacher was provided with rating scale of awareness of dyscalculia. After that completed rating scale was collected with respected teachers.

3.7 Statistic techniques used in the study

The tabulated data was thus processed for obtained mean, standard deviation, t-test is used for management and gender and f-test used for teaching experience and age group to analyze the difference as aimed in the objective of the study.

CHAPTER-IV
DATA ANALYSIS
&
INTERPRETATION

CHAPTER IV

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

Statistics is a body of mathematical technique or process for gathering, organizing and analyzing. Quantitative statistics is a basic tool of measurement evaluation and research statistics is data describe group behavior or group characteristics obtained from a number of individual observer, which are combined to make generalizations possible. Statistical method goes to the fundamental purpose of descriptive and analysis. By statistics we can analyze and interpret the data and can draw conclusion.

The data thus collected was subjected to appropriate statistical procedure to test the hypotheses with which this study was initiated. The details of the statistical techniques employed for analysis of the data, result obtained through this analysis and the decisions regarding the rejection or non rejection of hypothesis are presented in this chapter.

Analysis of data means studying the organized material in order to discover inherent facts. The data is studies from as many angles as possible to explore the new facts. Analysis requires an alert, flexible and open mind. It is worthwhile to prepare a plan of analysis before the actual collection of data.

Interpretation of data refers to that important part of the investigation, which is associated with the drawing of inference for the collected facts after an analytic study. It is extremely useful and important part of the study

because it makes possible the use of collected data statistical facts by themselves have no utility. it is the interpretation that makes it possible for us to utilize collected data in various field of activity. the usefulness of the collected data lies in its proper interpretation. it provides certain conclusion about the problem under study keeping the object of the study in view the data was collected and interpreted one by one.

4.2 Objectives of the Study

1. To find out the levels of awareness of dyscalculia among elementary school Teachers.
2. To find out the significant differences if any, in awareness of dyscalculia among elementary school teachers with regard to gender.
3. To find out the significant differences if any, in awareness of dyscalculia among elementary school teachers with regard to age.
4. To find out the significant differences if any, in awareness of dyscalculia among elementary school teachers with regard to management.
5. To find out the significant differences if any, in awareness of dyscalculia among elementary school teachers with regard to teaching experience.

4.3 Hypotheses of the Study

1. There is no significant difference in awareness of dyscalculia among elementary school teachers with regard to gender.
2. There is no significant difference in awareness of dyscalculia among elementary school teachers with regard to age.
3. There is no significant difference in awareness of dyscalculia among elementary school teachers with regard to management.
4. There is no significant difference in awareness of dyscalculia among elementary school teachers with regard to teaching experience.

4.4 Testing of hypothesis

$H_0$1: There is no significant difference in awareness of dyscalculia among elementary school teachers with regard to gender.

Table no. 4.1 Showing Mean, S.D. and t-value of dimensions of awareness with respect to Gender

DIMENSIONS	GENDER				t-value
	MALE (N=50)		FEMALE(N=50)		
	MEAN	S.D.	MEAN	S.D.	
Concept	31.6800	2.29854	30.9000	3.51817	1.312 @
Characteristics	30.0600	4.70089	29.0400	3.07697	1.284 @
Causes	30.8800	3.86845	30.7600	2.75947	0.179 @
Strategies	30.6600	3.19828	31.4200	4.27183	1.007 @
Assessment	31.4400	3.56376	30.5800	3.83906	1.161 @
Overall	154.72	10.417	152.70	8.633	1.056 @

@ Not significant at 0.01 & 0.05 levels

From the table, it is evident that the t-value for concept of dyscalculia (1.312) is not significant at both levels. It indicates that there is no significant difference in awareness on concept of dyscalculia due to variation in gender. From the mean values, it is evident that, male teachers have higher awareness on concept of dyscalculia (Mean: 31.68) than the female teachers (Mean: 30.90).

From the table, it is indicated that the t-value for characteristics of dyscalculia (1.284) is not significant at both levels. It indicates that there is no significant difference in awareness on characteristics of dyscalculia due to variation in gender. From the mean values, it is evident that, male teachers have higher awareness on characteristics of dyscalculia (Mean: 30.8800) than the female teachers (Mean: 29.0400).

From the table, it is depicted that the t-value for causes of dyscalculia (0.179) is not significant at both levels. It indicates that there is no significant difference in awareness on causes of dyscalculia due to variation in gender. From the mean values, it is evident that, male teachers have slightly higher awareness on causes of dyscalculia (Mean: 30.8800) than the female teachers (Mean: 30.7600).

From the table, it is shows that the t-value for strategies of dyscalculia (1.007) is not significant at both levels. It indicates that there is no significant difference in awareness on strategies of dyscalculia due to variation in gender. From the mean values, it is evident that, female teachers have higher awareness on strategies of dyscalculia (Mean: 31.4200) than the male teachers (Mean: 30.6600).

From the table, it is revealed that the t-value for assessment of dyscalculia (1.161) is not significant at both levels. It indicates that there is no significant difference in awareness on assessment of dyscalculia due to variation in gender. From the mean values, it is evident that, male teachers

have higher awareness on assessment of dyscalculia (Mean: 31.4400) than the male teachers (Mean: 30.5800).

From the table, it is points out that the t-value for overall awareness of dyscalculia (1.056) is not significant at both levels. It indicates that there is no significant difference in awareness on overall awareness of dyscalculia due to variation in gender. From the mean values, it is evident that, male teachers have higher awareness on overall awareness of dyscalculia (Mean: 154.72) than the male teachers (Mean: 152.70).

$H_0$2: There is no significant difference in awareness of dyscalculia among elementary school teachers with regard to age.

Table: 4.2 Showing Mean SD and F-value of dimensions of Awareness with respect to Age

Dimensions of Dyscalculia	Below 30 year		30-40 year		40 & above year		F- value
	mean	S.D.	mean	S.D.	mean	S.D.	
Concept	31.31	1.06	30.7	1.01	32.11	0.92	1.839 @
Characteristics	30.194	1.199	28.9	1.24	29.37	1.1	0.800 @
Causes	30.889	1.037	30.6	0.9	30.96	.08	0.079@
Strategies	31.75	1.146	30.9	1.1	30.3	0.87	1.195 @
Assessment	31.056	0.30871	30.2	0.9	32.04	0.82	1.919 @
Overall	31.03	1.11	30.26	1.03	30.98	0.75	1.769 @

@ Not significant at 0.01 & 0.05 levels

From the table, it is evident that the F-value for concept of dyscalculia (1.839) is not significant at both levels. It indicates that there is no significant

difference in awareness on concept of dyscalculia due to variation in age levels. From the mean values, it is evident that, above 40 year age group has higher awareness on concept of dyscalculia (Mean: 32.11) than the below 30 (Mean: 31.31) and 30-40 (30.7) age group.

From the table, it is reveals that the F-value for characteristics of dyscalculia (0.800) is not significant at both levels. It indicates that there is no significant difference in awareness on characteristics of dyscalculia due to variation in age levels. From the mean values, it is evident that, below 30 year age group has higher awareness on characteristics of dyscalculia (Mean: 30.194) than the below 30 -40 (29.37) and above 40 (Mean: 28.9) age group.

From the table, it is shows that the F-value for causes of dyscalculia (0.079) is not significant at both levels. It indicates that there is no significant difference in awareness on causes of dyscalculia due to variation in age levels. From the mean values, it is reveal that, all the three age group have some little bit difference.

From the table, it is pointed out that the F-value for strategies of dyscalculia (1.195) is not significant at both levels. It indicates that there is no significant difference in awareness on strategies of dyscalculia due to variation in age levels. From the mean values, it is evident that, below 30 year age group has higher awareness on strategies of dyscalculia (Mean: 31.75) than the below 30 -40 (Mean: 30.9) and above 40 (Mean: 30.3) age group.

From the table, it is evident that the F-value for assessment of dyscalculia (1.919) is not significant at both levels. It indicates that there is no significant difference in awareness on assessment of dyscalculia due to variation in age levels. From the mean values, it is evident that, above 40 year

age group has higher awareness on assessment of dyscalculia (Mean: 32.04) than the below 30 (Mean: 31.056) and 30-40 (30.2) age group.

From the table, it is pointed out that the F-value for overall awareness of dyscalculia among all the age group (1.769) is not significant at both levels. It indicates that there is no significant difference in awareness on overall awareness of dyscalculia due to variation in age. From the mean values, it is evident that, below 30 year age group is higher awareness on dyscalculia (Mean: 31.03) than other group.

$H_0$3: There is no significant difference in awareness of dyscalculia among elementary school teachers with regard to management.

Table 4.3 Showing Mean, SD & t-value of dimension of dyscalculia with respect to Management

DIMENSION OF DYSCALCULIA	MANAGEMENT				t-value
	GOVERNMENT SCHOOL (N=50)		PRIVATE SCHOOL (N=50)		
	MEAN	S.D.	MEAN	S.D.	
Concept	31.5	1.02	31.08	1.008	0.702 @
Characteristics	29.4	1.19	29.66	1.21222	0.351 @
Causes	30.9	0.92	30.74	0.8959	0.328 @
Strategies	30.6	1.03	31.46	1.0993	1.114@
Assessment	31.1	0.89	30.9	0.90301	.295 @
Overall	153.84	10.190	153.50	8.748	1.769@

@ Not significant at 0.01 & 0.05 levels.

From the above table, it is evident that the t-value for concept of dyscalculia (0.702) is not significant at both levels. It indicates that there is no significant difference in awareness on concept of dyscalculia due to variation in management. From the mean values, it is evident that, the government teachers and private teachers are similarly aware with respect to management.

From the table, it is indicate that the t-value for characteristics of dyscalculia (.351) is not significant at both levels. It indicates that there is no significant difference in awareness on characteristics of dyscalculia due to variation in management. From the mean values, it is evident that, the private school teacher is more awareness (Mean: 29.66) then government school teachers (Mean: 29.4).

From the table, it is depicted that the t-value for causes of dyscalculia (.328) is not significant at both levels. It indicates that there is no significant difference in awareness on causes of dyscalculia due to variation in management. From the mean values, it is evident that, government school teachers have slightly higher awareness on causes of dyscalculia (Mean: 30.9) than the private school teachers (Mean: 30.74).

From the table, it is shows that the t-value for strategies of dyscalculia (1.114) is not significant at both levels. It indicates that there is no significant difference in awareness on strategies of dyscalculia due to variation in management. From the mean values, it is evident that, the private school teachers have higher awareness on strategies of dyscalculia (Mean: 31.46) than the government school teachers (Mean: 30.6).

From the table, it is revealing that the t-value for assessment of dyscalculia (.295) is not significant at both levels. It indicates that there is no significant difference in awareness on assessment of dyscalculia due to variation in management. From the mean values, it is evident that, government school teachers have higher awareness on assessment of dyscalculia (Mean: 31.1) than the private school teachers (Mean: 30.9).

From the table, it is points out that the t-value for overall awareness of dyscalculia (1.769) is not significant at both levels. It indicates that there is no significant difference in awareness on overall awareness of dyscalculia due to variation in management. From the mean values, it is evident that, government school teachers have higher awareness on overall awareness of dyscalculia (Mean: 153.84) than the private school teachers (Mean: 153.50).

$H_0$4: There is no significant difference in awareness of dyscalculia among elementary school teachers with regard to teaching experience.

Table 4.4 Showing Mean, SD & F-value of dimension of dyscalculia with respect to teaching experience.

Dimensions Of Dyscalculia	Teaching Experience						F-value
	Below 10 year		10-20 year		20 year & above		
	mean	S.D.	Mean	S.D.	Mean	S.D.	
Concept	31.02	1.02	31.2	1.02	32.69	0.98	1.706@
Characteristics	29.75	1.17	29.6	1.2	28.2	1.3	.682 @
Causes	30.94	0.92	30.5	0.89	31	0.9	.165 @
Strategies	31.76	1.09	30.06	1.12	30.5	0.8	2.263@
Assessment	30.7	0.9	30.3	0.9	34.1	0.89	1.7 @
Overall	30.83	1.02	30.33	1.02	31.29	0.97	1.439@

@ Not significant at 0.01 & 0.05 levels.

From the table, it is evident that the F-value for concept of dyscalculia (1.706) is not significant at both levels. It indicates that there is no significant difference in awareness on concept of dyscalculia due to variation in teaching experience levels. From the mean values, it is evident that, above 20 year teaching experience group has higher awareness on concept of dyscalculia (Mean: 32.69) than the below 10 year teaching experience group (Mean: 31.02) and 10-20 year teaching experience group (31.2).

From the table, it is revealed that the F-value for characteristics of dyscalculia (.682) is not significant at both levels. It indicates that there is no significant difference in awareness on characteristics of dyscalculia due to variation in teaching experience levels. From the mean values, it is evident that, below 30 year teaching experience group has higher awareness on characteristics of dyscalculia (Mean: 29.75) than the below 10-20 year teaching experience (Mean: 29.6) and above 20 year teaching experience group (Mean: 28.2).

From the table, it shows that the F-value for causes of dyscalculia (.165) is not significant at both levels. It indicates that there is no significant difference in awareness on causes of dyscalculia due to variation in teaching experience levels. From the mean values, it is evident that, above 20 year teaching experience group has higher awareness on characteristics of dyscalculia (Mean: 31) than the below 10-20 year teaching experience (Mean: 30.5) and below 10 year teaching experience group (Mean: 30.94).

From the table, it is pointed out that the F-value for strategies of dyscalculia (2.263) is not significant at both levels. It indicates that there is no significant difference in awareness on strategies of dyscalculia due to variation in teaching experience. From the mean values, it is evident that, below 10 year age group has higher awareness on strategies of dyscalculia (Mean: 31.76) than the below 10 -20 year teaching experience (Mean: 30.06) and above 20 year teaching experience (Mean: 30.5).

From the table, it is evident that the F-value for assessment of dyscalculia (1.7) is not significant at both levels. It indicates that there is no significant difference in awareness on assessment of dyscalculia due to variation in teaching experience levels. From the mean values, it is evident that, above 20 year teaching experience group has higher awareness on assessment of dyscalculia (Mean: 34.1) than the below 10 year teaching experience (Mean: 30.7) and 10-20 year teaching experience group (Mean: 30.3).

From the table, it is points out that the F-value for overall awareness of dyscalculia among the entire teaching experience group (1.439) is not significant at both levels. It indicates that there is no significant difference in awareness on overall awareness of dyscalculia due to variation in teaching experience. From the mean values, it is evident that, above 20 year teaching experience group is higher awareness on dyscalculia (Mean: 31.29) than the below 10 year teaching experience group (Mean: 30.83) and 10-20 year teaching experience group (Mean: 30.33).

4.5 Descriptive Analysis

Table No. 4.5: Showing Number and Percentage (%) of Male and Female teachers with regard to levels of Awareness of Dyscalculia.

SCORING RANGE	DESCRIPTION	MALE		FEMALE	
		N (50)	%	N (50)	%
1-50	POOR	0	0	0	0
51-100	BELOW AVERAGE	0	0	0	0
101-150	AVERAGE	17	34	25	50
151-200	ABOVE AVERGE	33	66	25	50
201-250	GOOD	0	0	0	0

From the above table is clear that there are 17 male teachers (34%) have average level of awareness of Dyscalculia. There are 33 male teachers (66%) with above average in awareness of Dyscalculia and there are (66%) of male teacher with above average level in Dyscalculia Awareness.

From the above table is clear that there are 25 female teachers (50%) under the average level of awareness of Dyscalculia. There are 25 female teachers (50%) under the above average in awareness of Dyscalculia.

Table No. 4.6: **Showing Number and Percentage (%) of Age group with regard to levels of Awareness of Dyscalculia.**

SCORING RANGE	DESCRIPTION	BELOW 30 YEAR		30-40 YEAR		40 YEAR	
		N (36)	%	N (37)	%	N (27)	%
1-50	POOR	0	0	0	0	0	0
51-100	BELOW AVERAGE	0	0	0	0	0	0
101-150	AVERAGE	11	30.5	18	48.5	12	44.5
151-200	ABOVE AVERGE	25	69.5	19	51.5	15	55.5
201-250	GOOD	0	0	0	0	0	0

From the above table is evident that there are 11 teachers below 30 year age group (30.5%) under the average level of awareness of Dyscalculia. There are 25 teachers below 30 year age group (69.5%) under the above average in awareness of Dyscalculia. There are more below 30 year age group teachers (69.5%) under the level of above average in Awareness of Dyscalculia.

From the above table is indicated that there are 18 teachers, 30-40 year age group (48.5%) under the average level of awareness of Dyscalculia. There are 19 teachers 30 year age group (51.5%) under the above average in

awareness of Dyscalculia. There are more 30-40 year age group teachers (51.5%) under the level of above average in Awareness of Dyscalculia.

From the above table is evident that there are 12 teachers above 40 year age group (44.5%) under the average level of awareness of Dyscalculia. There are 15 teachers above 40 year age group (55.5%) under the above average in awareness of Dyscalculia. There are more above 40 year age group teacher (55.5%) under the level of above average in Awareness of Dyscalculia.

Table No. 4.7: Showing Number and Percentage (%) of Government school teachers and Private school teachers with regard to levels of Awareness of Dyscalculia.

SCORING RANGE	DESCRIPTION	GOVT. TEACHER		PRIVATE TEACHER	
		N (50)	%	N (50)	%
1-50	POOR	0	0	0	0
51-100	BELOW AVERAGE	0	0	0	0
101-150	AVERAGE	27	54	20	40
151-200	ABOVE AVERGE	23	46	30	60
201-250	GOOD	0	0	0	0

From the above table is evident that there are 27 Government teachers (54%) under the average level of awareness of Dyscalculia. There are 23 male teachers (46%) under the above average in awareness of Dyscalculia. there

are more Government teacher (54%) under the level of average in Dyscalculia Awareness.

From the above table is evident that there are 20 Private teachers (40%) under the average level of awareness of Dyscalculia. There are 30 Private teachers (60%) under the above average in awareness of Dyscalculia. there are more Private teacher (60%) under the level of above average in Dyscalculia Awareness.

Table No. 4.8: Showing Number and Percentage (%) of teaching experience with regard to levels of Awareness of Dyscalculia

SCORING RANGE	DESCRIPTION	BELOW 10 YEAR		10 – 20 YEAR		ABOVE 20 YEAR	
		N (54)	%	N (33)	%	N (13)	%
1-50	POOR	0	0	0	0	0	0
51-100	BELOW AVERAGE	0	0	0	0	0	0
101-150	AVERAGE	21	38.9	18	54.5	5	38.5
151-200	ABOVE AVERGE	33	61.1	15	45.5	8	61.5
201-250	GOOD	0	0	0	0	0	0

From the above table is evident that there are 21 teachers below 10 year Teaching Experience group (38.9%) under the average level of awareness of Dyscalculia. There are 33 teachers below 10 year Teaching Experience group (61.1%) under the above average in awareness of

Dyscalculia. There are more below 10 year teaching experience group teacher (61.1%) under the level of above average in Awareness of Dyscalculia.

From the above table is evident that there are 18 teachers 10-20 year Teaching Experience group (54.5%) under the average level of awareness of Dyscalculia. There are 15 teachers, 10-20 year Teaching Experience group (45.5%) under the above average in awareness of Dyscalculia. There are more 10-20 year teaching experience group teacher (54.5%) under the level of average in Awareness of Dyscalculia.

From the above table is evident that there are 5 teachers above 20 year Teaching Experience group (38.5%) under the average level of awareness of Dyscalculia. There are 8 teachers above 20 year Teaching Experience group (61.5%) under the above average in awareness of Dyscalculia. There are more above 20 year teaching experience group teacher (61.5%) under the level of above average in Awareness of Dyscalculia.

CHAPTER-V

SUMMARY & FINDINGS

CHAPTER V

SUMMARY AND FINDING

5.1 Introduction

This chapter deals with summary of the research. It contains statement of the problem, objectives of the study, hypothesis of the study, methodology of the study, statistical techniques and finding of the study and suggestion for further research.

5.2 Statement of the problem

Awareness of Dyscalculia among the Elementary School Teachers.

5.3 Objective of the study

1. To find out the levels of awareness of dyscalculia among elementary school Teachers.
2. To find out the significant differences if any, in awareness of dyscalculia among elementary school teachers with regard to gender.
3. To find out the significant differences if any, in awareness of dyscalculia among elementary school teachers with regard to age.
4. To find out the significant differences if any, in awareness of dyscalculia among elementary school teachers with regard to management.
5. To find out the significant differences if any, in awareness of dyscalculia among elementary school teachers with regard to teaching experience.

5.4 Hypotheses of the study

1. There is no significant difference in awareness of dyscalculia among elementary school teachers with regard to gender.
2. There is no significant difference in awareness of dyscalculia among elementary school teachers with regard to age.
3. There is no significant difference in awareness of dyscalculia among elementary school teachers with regard to management.
4. There is no significant difference in awareness of dyscalculia among elementary school teachers with regard to teaching experience.

5.5. Methodology

5.5.1 Variables

The present study consisting of two types of variables –Independent and Dependent variable

Independent variables are- (1) Gender
(2) Age
(3) Management
(4) Teaching Experience

Dependent variable is- (1) Awareness

5.5.2 **Method** – The present study involves Survey method which is a descriptive in nature.

5.5.3 Sample – The present study consisting of 100 teachers working at elementary level in Amla block. Simple random stratified technique is used in this study.

5.5.4 Research tool

In the present study, the tool used in the study is Rating scale of awareness of dyscalculia which is constructed and developed by Dr. Chintal Siva Sankar (2010).

The rating scale which is used in this present study is five point rating scale. There are 50 statements in this scale. The scale is divided into five dimensions which are related to concept, characteristics, causes, strategies and assessment. In this scale, there are five options i.e. SA (strongly agree), A (agree), UN (undecided), D (disagree) and SD (Strongly disagree).

The reliability of the Rating scale is 0.0905

The intrinsic validity is of the rating scale is 0.92

It also possesses face validity and content validity

5.5.5 Delimitations of the study

1. The Study is limited to sample of 100 Teachers. Working at elementary level.
2. The study is limited to area located in Amla block at Betul district in M.P.
3. The study is limited to Single dependent variable, namely Awareness.
4. The study is limited to four Independent variables- Gender, Age, Management and Teaching Experience.

5.6 Data Analysis

Data is analyzed by using below mentioned statistical techniques namely –

Mean

S.D.

t-test

F-test

5.7 Findings

1) There is no significant difference in awareness on concept of dyscalculia due to variation in gender. Male teachers have higher awareness on concept of dyscalculia.
2) There is no significant difference in awareness on characteristics of dyscalculia due to variation in gender. Male teachers have higher awareness on characteristics of dyscalculia
3) There is no significant difference in awareness on causes of dyscalculia due to variation in gender. Male teachers have slightly higher awareness on causes of dyscalculia.
4) There is no significant difference in awareness on strategies of dyscalculia due to variation in gender. Female teachers have higher awareness on strategies of dyscalculia
5) There is no significant difference in awareness on assessment of dyscalculia due to variation in gender. Male teachers have higher awareness on assessment of dyscalculia
6) There is no significant difference in awareness on overall awareness of dyscalculia due to variation in gender. Male teachers have higher awareness on overall awareness of dyscalculia.

7) There is no significant difference in awareness on concept of dyscalculia due to variation in age levels. Above 40 year age group has higher awareness on concept of dyscalculia.

8) There is no significant difference in awareness on characteristics of dyscalculia due to variation in age levels. Below 30 year age group has higher awareness on characteristics of dyscalculia.

9) There is no significant difference in awareness on causes of dyscalculia due to variation in age levels. From the mean values, it is reveal that, all the three age group have some little bit difference.

10) There is no significant difference in awareness on strategies of dyscalculia due to variation in age levels. Below 30 year age group has higher awareness on strategies of dyscalculia.

11) There is no significant difference in awareness on assessment of dyscalculia due to variation in age levels. Above 40 year age group has higher awareness on assessment of dyscalculia.

12) There is no significant difference in awareness on overall awareness of dyscalculia due to variation in age. Below 30 year age group is higher awareness on dyscalculia respect to age.

13) There is no significant difference in awareness on concept of dyscalculia due to variation in management. The government teachers and private teachers are similarly aware with respect to management.

14) There is no significant difference in awareness on characteristics of dyscalculia due to variation in management. The private school teacher is more awareness then government school teachers.

15) There is no significant difference in awareness on causes of dyscalculia due to variation in management. Government school teachers have slightly higher awareness on causes of dyscalculia then the private school teachers.

16) There is no significant difference in awareness on strategies of dyscalculia due to variation in management. The private school

teachers have higher awareness on strategies of dyscalculia than the government school teachers.

17) There is no significant difference in awareness on assessment of dyscalculia due to variation in management. Government school teachers have higher awareness on assessment of dyscalculia than the private school teachers.

18) There is no significant difference in awareness on overall awareness of dyscalculia due to variation in management. Government school teachers have higher awareness on overall awareness of dyscalculia than the private school teachers.

19) There is no significant difference in awareness on concept of dyscalculia due to variation in teaching experience levels. Above 20 year teaching experience group has higher awareness on concept of dyscalculia.

20) There is no significant difference in awareness on characteristics of dyscalculia due to variation in teaching experience levels. Below 30 year teaching experience group has higher awareness on characteristics of dyscalculia.

21) There is no significant difference in awareness on causes of dyscalculia due to variation in teaching experience levels. Above 20 year teaching experience group has higher awareness on characteristics of dyscalculia.

22) There is no significant difference in awareness on strategies of dyscalculia due to variation in teaching experience. Below 10 year age group has higher awareness on strategies of dyscalculia.

23) There is no significant difference in awareness on assessment of dyscalculia due to variation in teaching experience levels. Above 20 year teaching experience group has higher awareness on assessment of dyscalculia.

24) There is no significant difference in awareness on overall awareness of dyscalculia due to variation in teaching experience. Above 20 year teaching experience group is higher awareness on dyscalculia

25) There are 66% male teachers under the level of above average in Dyscalculia Awareness. There are 69.5% below 30 year age group teachers under the level of above average in Awareness of Dyscalculia.

26) There are 51.5% 30-40 year age group teachers under the level of above average in Awareness of Dyscalculia.

27) There are 55.5% above 40 year age group teachers under the level of above average in Awareness of Dyscalculia.

28) There are 54% Government teachers under the level of average in Dyscalculia Awareness.

29) There are 60% Private teachers under the level of above average in Dyscalculia Awareness.

30) There are 61.1% below 10 year teaching experience group teachers under the level of above average in Awareness of Dyscalculia

31) There are 54.5%)10-20 year teaching experience group teachers under the level of average in Awareness of Dyscalculia.

32) There are 61.5% above 20 year teaching experience group teachers under the level of above average in Awareness of Dyscalculia.

5.8 Educational Implications of the Study-

(1) This study can give certain insightful strategies for teachers to deal children with dyscalculia.

(2) This study helps teachers in recognizing signs and symptoms of dyscalculic children and also root causes for their inability in calculations.

(3) This kind of study can be applicable at pre secondary level, secondary level and higher secondary level.

(4) This study helps researchers to make various questionnaire, attitude scales and rating scales for knowing awareness of dyscalculia.

5.9 SUGGETIONS TO FURTHER RESEARCHER

1) This study can be extended by increasing the size of the sample.
2) Similar study can be done by taking different type of schools such as urban school and private school, CBSE School and M.P. Govt. School.
3) The study can be extended to other part of the state.
4) Difference class levels can be selected.
5) The study could be extended to math's background teachers and social science background teachers.
6) The study can be extended to various medium of instructions.

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APPENDIX

Rating Scale of Awareness of Dyscalculia

Constructed & developed by

Dr. C. Siva Sankar (2010)

Part-1

Sir/Madam,

You are requested to fill the information appropriately.

1. Name of the teacher.....
2. Name of the school.....
3. Gender (Male/Female).....
4. Age (Below 30Yeas/ Between 30-40Years/Above 40 Years.....
5. Teaching Experience (Below 10 Yrs/Between 10-20 Yrs/Above 20 Yrs.....
6. Management (Govt. /Private).....
7. Locality (Rural/Urban).....
8. Medium of Instruction (Hindi/English).....

Part-2

There are statements in connection with Dyscalculia under given below. Each statement has five alternative responses namely, Strongly Agree (**SA**), Agree (**A**) undecided (**UN**), Disagree (**D**) and Strongly Disagree (**SD**). You are requested to study the each statement carefully in connection with dyscalculia (disability in calculations) and give your valuable response by putting (√) against each statement given below.

S.NO	STATEMENTS	SA	A	UN	D	SD
1	Dyscalculia is a specific learning disability.					
2.	Dyscalculia is a sort of number blindness.					
3	Dyscalculia is not mathematical dyslexia.					
4	Dyscalculia indicates logical reasoning with numbers.					
5	Dyscalculia includes difficulty in arithmetic calculations.					
6	Dyscalculia is associated with neurological disorder.					
7	Dyscalculia is not the mathematical disability in which a person gets difficulty in grasping mathematical concepts.					

8	Dyscalculia is the qualitative skill impairment caused by the difficulty in visually processing numbers.					
9	Dyscalculia is the spatial skill impairment caused by the difficulty in language processing difficulty.					
10	Dyscalculia cannot be curable.					
11	Children with dyscalculia can understand temporal relations (after, before, between etc).					
12	Dyscalculic children have very little spatial problems (greater than, less than etc)					
13	Children with dyscalculia are unable to count and compare the numbers					
14	Children with dyscalculia are unable to apply mathematical formulae.					
15	Children with dyscalculia have more knowledge on time and directions.					
16	Children with dyscalculia are able to copy the geometrical figures easily.					
17	Children with dyscalculia feel tension, fear and fatigue in mathematics classroom.					
18	Children with dyscalculia often write numbers in reverse order (63 as36, 9 as6 etc).					
19	Children with dyscalculia don't have left-right orientation.					
20	Children with dyscalculia can do calculations using mathematical signs (+, -, * & /).					
21	Mathematical phobia leads to dyscalculia.					
22	Attention Deficit and Hyperactivity Disorder (ADHD) is a factor for dyscalculia.					
23	Low birth weight is not a cause for dyscalculia.					
24	Brain function is a cause for dyscalculia.					
25	Language deficit is a ground for dyscalculia.					
26	Foetal disorder is a major ground for dyscalculia.					
27	Processing deficit does not lead to dyscalculia.					
28	Genetic disorder does not lead to dyscalculia.					
29	Mental retardation is an influencing cause for dyscalculia.					
30	Inadequate instruction and lack of motivation are factors for dyscalculia.					
31	Electro-shock therapy is not suitable treatment for overcoming dyscalculia.					
32	Co-operative learning in connection with peer assistance increases dyscalculia.					
33	Using templates (flash cards, pictures etc) gives desirable progress among dyscalculic children.					

34	Regular practice gives self-confidence in Mathematics among dyscalculic children.					
35	Individual instruction or one-to-one environment is not appropriate for dyscalculic children.					
36	Using of fingers and scratching papers is an unwanted strategy for children with dyscalculia.					
37	Connecting Mathematics with real life situations helps dyscalculic children for focusing on calculations.					
38	Encouraging usage of graph papers is better for dyscalculics.					
39	Planned repetition for teaching Mathematics to children with dyscalculia is not needed.					
40	Task analysis is an impractical technique to teach Mathematics for dyscalculic children.					
41	Children with dyscalculia can be assessed with IQ tests.					
42	Diagnostic test helps in identifying the children with dyscalculia.					
43	Children with dyscalculia cannot be noticed through achievement tests.					
44	Teacher's non-participative observation is an important to identify the children with dyscalculia					
45	Teachers through interaction with the students can identify dyscalculia.					
46	Teachers may orally ask questions to identify the inability of the students in calculations					
47	Prognostic tests don't help in assessing the probability success of the students in calculations					
48	Memory tests are not useful to notice the inability of children in numerical calculations					
49	Interview schedule is a useful tool for identifying the children with dyscalculia					
50	Children with dyscalculia can be identified through their performance in mathematical games					

THANK YOU.

Rating Scale of Awareness of Dyscalculia

Constructed & developed by

Dr. C. Siva Sankar (2010)

Part-1

शिक्षक / शिक्षिका,

आप से निवेदन है कि, निम्नलिखित सूचनाओं को ध्यान पूर्वक भरे :–

1. शिक्षक का नाम .....
2. विद्यालय का नाम .....
3. लिंग (पुरूष / महिला) .....
4. आयु (30 वर्ष से कम / 30 से 40 वर्ष / 40 वर्ष से अधिक) .....
5. शिक्षण अनुभव (10 वर्ष से कम / 10 से 20 वर्ष / 20 वर्ष से अधिक) .....
6. विद्यालय प्रबंधन (शासकीय या अशासकीय) .....
7. स्थानीयता (शहरी / ग्रामीण) .....
8. शिक्षण का माध्यम (हिन्दी / अंग्रेजी) .....

Part-2

निचे Dyscalculia से सम्बंधित कुछ Statement दिये गये है प्रत्येक Statement में पाँच वैकल्पिक प्रतिक्रियाएं हैं जैसे– दृढ़ता से सहमत हैं (एस.ए.), सहमत हैं (ए), अनिर्णीत (यू.एन.), असहमत (डी) तथा जोरदार असहमत (एस.डी.)। आप से निवेदन है कि आप प्रत्येक Statement जो कि Dyscalculia (गणना करने में विकलांगता या परिकलनो में गलती करना) से सम्बंधित हैं। इन्हें ध्यान पूर्वक पढ़े तथा प्रत्येक Statement के सामने (√) अपनी मुल्यवान प्रतिक्रिया देवें।

S.NO	STATEMENTS	SA	A	UN	D	SD
1	Dyscalculia एक विशिष्ट अधिगम अयोग्यता हैं।					
2	Dyscalculia संख्या अंधापन का एक प्रकार हैं।					
3	Dyscalculia गणितीय डिस्लेक्सिया नहीं हैं।					
4	Dyscalculia संख्या के साथ तार्किक तर्क इंगित करता है।					
5	अंकगणितीय गणना में कठिनाई को ही Dyscalculia कहते हैं।					
6	Dyscalculia स्नायुविक विकार से सम्बंधित हैं।					
7	Dyscalculia गणितीय विकलांगता नहीं हैं, जिसमें एक व्यक्ति गणितीय अवधारणा को ग्रहण करने में कठिनाई महसूस करता हैं।					

8	Dyscalculia गुणात्मक कौशल हैं जो कि दृश्य संख्या प्रक्रिया में कठिनाई के कारण होता हैं।					
9	Dyscalculia स्थानिक कौशल हैं जो कि भाषा प्रक्रिया में कठिनाई के कारण होता हैं।					
10	Dyscalculia का इलाज नहीं किया जा सकता हैं।					
11	Dyscalculia से प्रभावित बच्चे अग्रलिखित सम्बंधो को समझ सकते है जैसे– के बाद, पहले, बीच में इत्यादि।					
12	Dyscalculia से प्रभावित बच्चों को बहुत कम स्थानिक समस्या होती हैं जैसे– से अधिक, से कम।					
13	Dyscalculia से प्रभावित बच्चे गिनती और तुलना करने के असमर्थ होते हैं।					
14	Dyscalculia से प्रभावित बच्चों का गणितीय सूत्रों को लागू करने में कठिनाई होती हैं।					
15	Dyscalculia से प्रभावित बच्चों को समय और दिशाओं का अधिक ज्ञान होता हैं।					
16	Dyscalculia से प्रभावित बच्चे ज्यामिति आंकड़े को आसानी से कॉपी कर सकते हैं।					
17	Dyscalculia से प्रभावित बच्चों को गणित की कक्षा में तनाव, भय और थकान महसूस करते हैं।					
18	Dyscalculia से प्रभावित बच्चे अक्सर उल्टे क्रम में संख्या लिखते हैं। जैसे– 36 को 63, 9 को 6।					
19	Dyscalculia से प्रभावित बच्चों को बायें–दायें का ज्ञान होता नहीं होता हैं।					
20	Dyscalculia से प्रभावित बच्चे गणितीय प्रतिकों (+, –, ÷, X) का उपयोग करते हुये गणना कर सकते हैं।					
21	गणितीय भय Dyscalculia की ओर ले जाता हैं।					
22	ध्यान का आभाव एवं Hyper Activity विकार Dyscalculia के कारक हैं।					
23	जन्म के समय वजन कम होना Dyscalculia का कारण नहीं हैं।					
24	मस्तिष्क क्रियाएं Dyscalculia का कारक हैं।					
25	पूर्ण भाषा का आभाव Dyscalculia के लिए एक प्रमुख कारण हैं।					
26	Foetal विकार Dyscalculia के लिए एक प्रमुख कारण हैं।					
27	गणितीय संक्रियाओं का आभाव Dyscalculia की ओर नहीं ले जाता हैं।					
28	अनुवांशिक विकार Dyscalculia की ओर नहीं ले जाता हैं।					
29	मानसिक मंदता Dyscalculia का एक प्रभावी कारक हैं।					
30	अप्रर्याप्त शिक्षा व प्रेरणा की कमी Dyscalculia के लिए एक प्रभावी कारक हैं।					
31	इलेक्ट्रो आघात चिकित्सा Dyscalculia पर काबू पाने के लिए उपयुक्त उपचार नहीं हैं।					

32	मित्र मंडली के साथ सहयोगात्मक अधिगम Dyscalculia को बढ़ाता हैं।					
33	टेम्पलेट्स (फ्लैशकार्ड, चित्र आदि) का प्रयोग Dyscalculic बच्चों के बीच वांछनीय प्रगति देता हैं।					
34	नियमित अभ्यास से Dyscalculic बच्चों में गणित के प्रति आत्मविश्वास बढ़ता हैं।					
35	व्यक्तिगत निर्देशन या एक के लिए एक वातावरण Dyscalculic बच्चों के लिए उपयुक्त नहीं हैं।					
36	उंगलियों का प्रयोग Dyscalculic बच्चों के लिए गलत रणनिति हैं।					
37	वास्तविक जीवन की परिस्थितियों को गणित के साथ जोड़ने से Dyscalculic बच्चों में गणना के प्रति अधिक ध्यान केन्द्रीत होता हैं।					
38	ग्राफ पेपर का उपयोग करना Dyscalculic बच्चों के लिए अच्छा हैं।					
39	Dyscalculia से प्रभावित बच्चों को गणित पढ़ाने के लिए नियोजित पुनरावृत्ति की जरूरत नहीं होती हैं।					
40	Dyscalculic बच्चों को गणित सिखाने के लिए कार्य विश्लेषण तकनीक एक अव्यवहारिक तकनीक हैं।					
41	बुद्धि–लब्धि परीक्षण द्वारा Dyscalculic बच्चों का मुल्यांकन किया जा सकता हैं।					
42	डायग्नोस्टिक परीक्षण Dyscalculia से प्रभावित बच्चों की पहचान करने में मदद करता हैं।					
43	Dyscalculia से प्रभावित बच्चों को उपलब्धि परीक्षण के माध्यम से नहीं पहचाना जा सकता हैं।					
44	Dyscalculia की पहचानने करने के लिए शिक्षक को सहभागी अवलोकन करना चाहियें।					
45	छात्रों के साथ बातचीत के माध्यम से शिक्षक Dyscalculia की पहचान कर सकते हैं।					
46	शिक्षक द्वारा मौखिक रूप से सवाल करके गणितीय गणना करने में असक्षम बच्चों की पहचान की जा सकती हैं।					
47	Prognostic Test ऐस छात्रों की पहचान करने में सहायता नहीं करते जो गणना करने में असमर्थ होते हैं।					
48	मांनसिक परीक्षण बच्चों की संख्यात्मक गणना करने की असक्षमता जानने हेतु उपयोग नहीं किया जाता हैं।					
49	साक्षात्कार अनुसूची Dyscalculia से प्रभावित बच्चों की पहचान करने के लिए एक उपयोगी उपकरण हैं।					
50	Dyscalculia से प्रभावित बच्चों को गणितीय खेल में उनके प्रदर्शन के माध्यम से पहचाना जा सकता हैं।					

Date : / /

Signature

धन्यवाद