VALIDATION OF M-TROLL TO IDENTIFY CHILDREN AT RISK FOR LEARNING DISABILITY

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University of Mysore

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CERTIFICATE

This is to certify that the dissertation entitled **'Validation of M-TROLL to identify children at risk for learning disability'** is a bonafide work submitted in partial fulfillment for the degree of Master of Science (Speech-Language Pathology) of the student registration number: P01II22S123015. It has been carried out under the guidance of a faculty of this institution and has not been submitted earlier to any other university for the award of any diploma or degree.

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CERTIFICATE

This is to certify that the dissertation entitled '**Validation of M-TROLL to identify children at risk for learning disability** 'has been prepared under my supervision and guidance. It is also certified that this dissertation has not been submitted earlier to any other university for an award of any diploma or degree.

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DECLARATION

This is to certify that the dissertation entitled '**Validation of M-TROLL to identify children at risk for learning disability'** is a result of my own study done under the guidance of Dr. Jayashree C Shanbal, Professor of Language Pathology, Department of Speech-Language Pathology, All India Institute of Speech and Hearing, Mysore. This dissertation has not been previously submitted to any other university for the award of any diploma or degree.

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TABLE OF CONTENTS

List of Tables

List of Figures

CHAPTER I

INTRODUCTION

According to the DSM-5 (2015), Specific Learning Disability (SLD) is a neurodevelopmental condition that impedes progress in academic learning, even when other developmental aspects seem to be in line with age-related expectations. This condition primarily manifests as difficulties in reading, writing, and arithmetic, as these skills are fundamental to the acquisition of another academic knowledge. The realm of learning disabilities (LD) is a relatively new area of focus in India. According to the RPWD Act, specific learning disability (SLD) is identified as a varied range of conditions marked by difficulties in processing language, whether it be spoken or written. These difficulties can manifest in challenges related to comprehension, verbal expression, reading, writing, spelling, or performing mathematical calculations. Examples of such conditions encompass perceptual disabilities, dyslexia, dysgraphia, dyscalculia, dyspraxia, and developmental aphasia (Ministry of Law and Justice, 2016). According to the systematic review and meta-analysis conducted by Babita et al. (2022) on the prevalence of learning disabilities in India, the reported rates among Indian children varied from 2.16% to 30.77% across the studies.

Language is used by children to interact with the people in their environment including parents, peers, and teachers. Through this interaction, children will gain knowledge and skills which are needed for future success in literacy. According to Roskos and Tabors (2005), children's speaking and

listening abilities set the stage for their reading and writing abilities, and these language skills taken together serve as the main cognitive resources for all subsequent learning. Upon scrutinizing the language system and educational policies in India, it becomes apparent that Indian schools follow a biliteracy or multiliteracy educational system, because of the country's extended history of linguistic and cultural diversity. The three-language formula of Indian education policy, which has been advocated by NEP (2020) also aids in promoting multilingualism in India and enables students to communicate effectively across the country. In this context, the literature indicates that there is a potential for varying literacy development across different languages. A child may excel in literacy skills in one language while struggling in others. Therefore, in this context, assessment is crucial to determine whether a child's learning challenges arise from a lack of proficiency in the school's language or a Learning Disability (Ramaa, 2000).

Teachers at the school typically play a primary role in the initial identification of students with Learning Disabilities. Subsequently, they refer these students to special educators or speech-language pathologists for diagnosis and assessment to identify specific disorder traits. Various studies collectively suggest that teacher assessments can be a valid tool for identifying children at risk of dyslexia (Snowling 2011; Snowling 2012). According to Markusic (2009), one of the characteristics of a good assessment includes 'skilled teacher direction', since the teachers are the individuals who guide the assessment processes as they possess a comprehensive understanding of the classroom dynamics. The Rhode Island Prek–12 literacy policy (2005) states

that four different kinds of assessments can be done in the classroom: screening, diagnostic, progress monitoring, and outcome. The Progress monitoring assessment concerns ongoing curriculum-based assessment, in which students at risk of learning disabilities are assessed, more frequently; where the assessment concentrates on individual learning strengths and weaknesses. These assessments gauge a student's learning advancement within the classroom setting, establishing personalized goals. Consequently, teachers can promptly recognize challenges, thereby facilitating timely referrals for special education or speech-language pathology services, and promoting early intervention.

Bishop and Fletcher (2001) found out that teacher-administered screening questionnaires show promise as a cost-effective and efficient means of identifying children at risk of educational difficulties. Nevertheless, the current instruments were deemed to lack the necessary precision. As education continues to expand into an increasingly comprehensive and diverse field, accurate and thorough evaluation approaches that can identify and assist students who may require additional assistance are crucial. One promising method for early identification is the relatively new TROLL (Dickinson, McCabe, & Sprague, 2001, 2003) assessment, which identifies children who may be at risk for learning disability.

The Teacher Rating of Oral Language and Literacy (TROLL) is a rating tool developed by David Dickinson, in the year 2001, to provide teachers with a way to track the language and literacy development of children in their classrooms. Although initially designed for research purposes unrelated to the

New Standards initiative, TROLL (Dickinson et al., 2001, 2003) includes all the essential speaking and listening skills outlined in the New Standards. This tool contains three subscales: (a) language use, (b) reading, and (c) writing. Cooper et al. (2002) proposed that, overall, the development of early reading is influenced significantly by oral language, particularly in its impact on the emergence of phonological awareness. Considering this finding, consequently, in the study conducted by Merlin Thankam, in the year 2011, from All India Institute of Speech and Hearing, Mysore, an extra subtest called phonological awareness was added to the adapted version of the TROLL (Dickinson et al.,2001, 2003), thus renamed it as M-TROLL (Thankam & Shanbal, 2011).

Need for the study

The intricate and multi-tiered nature of the education system in India, where students must learn in a language other than their native tongue, complicates the diagnosis of learning disabilities and makes estimating their prevalence nearly impossible. The profound absence of teacher knowledge, assessment methods, or culturally specific assessment tools for evaluating processing deficits, intelligence, and proficiency in reading and writing adds another layer of complexity to the concept of Learning Disability, as highlighted by Karanth (2002).The engagement of speech-language pathologist, who are required to closely collaborate with teachers in setting appropriate goals and activities for students in classrooms, as well as creating intervention plans for individual children, is hindered by the influence of the clinical setting in which they work. In many instances, their level of engagement with reading disabilities is primarily influenced by personal interest, posing a constraint on

the effectiveness of interventions, as observed by Nirupama and Karanth (2003).Therefore, it is the responsibility of a speech-language pathologist to assess the necessity of validating a tool for this purpose and evaluate its applicability in the early diagnosis of children at risk of learning disabilities, specifically in the Indian context.

Early identification of children who may be prone to developing learning disabilities is a crucial step in ensuring they receive the essential support and interventions for a successful educational experience. In recent years, the TROLL (Dickinson et al.,2001, 2003) assessment has emerged as a potential tool for identifying learning disabilities in individuals. Nonetheless, it is crucial to conduct additional research to confirm the accuracy and effectiveness of its adapted version, M-TROLL (Thankam &Shanbal, 2011). This present study addresses this gap in knowledge by outlining a comprehensive study to assess the validity of the M-TROLL (Thankam & Shanbal, 2011) to identify children who are at risk for learning disabilities.

Aim and Objectives of the Study

The primary aim of the present study was to validate the Modified - Teacher's Rating of Oral Language and Literacy (M-TROLL) as adapted by Thankam and Shanbal (2011), originally provided as TROLL by the author Dickinson et al. (2001, 2003) as a reliable tool for identifying children at risk for learning disability, contributing to early intervention and assistance in educational environments.

Objectives of the study

The objectives of the study included the following:

1. To evaluate and compare M-TROLL (Thankam & Shanbal, 2011) assessments scores among various educators and professionals (Speech-Language Pathologists and Teachers).
2. To study the relationship between the M-TROLL (Thankam & Shanbal, 2011) assessment score with the ELST (Goswami and Shanbal, 2009).

Hypotheses of the study

The following null hypotheses are proposed for the present study:

$H_0$1 There is no significant difference between M-TROLL (Thankam & Shanbal, 2011) assessments given by teachers and SLP on administering M-TROLL (Thankam & Shanbal, 2011) in similar populations.

$H_0$2 There is no significant correlation between M-TROLL (Thankam & Shanbal, 2011) assessment scores and ELST (Goswami & Shanbal, 2009) scores.

CHAPTER II

Review of Literature

India's vast linguistic legacy contributes to its multilingualism. The nation's educational system, where instruction takes place in different languages based on the location and particular educational programs, reflects the diversity of languages. Unlike the West, India has minimal understanding of specific learning disorders. For many years, children in India who had dyslexia or other cognitive difficulties went misdiagnosed, were called "difficult" or "not bright," and were consequently disadvantaged in their social and professional lives. Nonetheless, due to an economic upturn and rapidly expanding literacy rates, this debilitating social and educational difficulties has become more widely acknowledged.

According to recent surveys, between 13 and 14 percent of Indian schoolchildren suffer from a learning disability. In order to ascertain the prevalence of SLD in India, one systematic review study carried out by NIMHANS examined data from Indian studies. It found that approximately 8% of children in India suffer from SLD. This can apply to cases that are mild, moderate, or severe. Approximately 88% of children diagnosed with dyslexia, dyscalculia, and dysgraphia, and approximately 10% of children with dyslexia and dysgraphia, were part of a 5-year study of children who came to the Learning Disability Centre in metropolitan India (Singh et al., 2017). The identification and raising of awareness of dyslexia is made even more difficult in nonmetropolitan areas due to a dearth of specialized clinics and qualified staff. Though studies also suggest that learning disabilities are underreported,

the 15% prevalence estimate of learning disabilities that is now recognized is thought to be exaggerated.

For health professionals, screening millions of students to identify those with specific learning problems is logistically unfeasible. Consequently, the awareness and understanding of learning disorders among school teachers could significantly contribute to the early detection and handling of these disorders. A summary of few studies of research about early learning disability identification and the role of teachers in this process is given below.

1.1 Early identification of learning disability in children

The methods employed to identify children at risk of literacy difficulties have a significant impact on the effectiveness of early intervention. Intervening with children experiencing language learning difficulties during the early school years can effectively address academic failure as noted in research by Anderson et al. (2003) and ASHA (2000). Typically, teachers are responsible for primary identification of students with Learning Disabilities by observing and assessing the need for diagnosis and further assessment. Following that, these students are referred to special educators, or counsellors, who aim to identify the child's disorder traits.

Identifying children with dyslexia at an early stage can help in improving their academic performance through timely intervention, but it is a challenging task in India (Misquitta et al., 2023). This is mainly due to the lengthy formal testing and assessment processes currently in place, leading to

delays in interventions (Karande et al., 2011). Similarly, Misquitta et al. (2003) highlighted the additional challenges in identifying dyslexia in a densely populated developing country like India.

The identification methods for children at risk of literacy difficulties must be precise and perceptive. They must be detailed enough to prevent excessive labelling of children who are not truly at risk. Misdiagnosis may result in unnecessary worry and stress for parents or caregivers, stigma from being labelled as impaired, and wasted time and money (Catts, 2017). While it is ideal to identify developmental dyslexia at an early age, it is nearly challenging to identify a dyslexic child under five years old since they might not be actively participating in phonological activities (Parameshwari & Lalithaa, 2022). Additionally, as a result of both maturation and education, children's skills improve quickly, and depending on the stage of development, different identification techniques will be more sensitive than others (Cunningham & Carroll, 2011; Speece, 2005; Thompson et al., 2015).

The overall academic success in higher classes can be predicted with reasonable accuracy by using reading outcomes at early grades (Torgesen and Wagner, 2002) and early identification of children at risk for reading difficulties (Shaywitz et al., 1992; Juel, 1988). Identifying and serving this group of children during the early school years has also been linked to increased graduation rates and enhanced productivity in life (Strickland & Riley-Ayers, 2006).

Flawed diagnoses lead to misidentification of learning disabilities, impacting both inclusion and exclusion rates. In light of this, there are uncertain incidence rates of learning disabilities (NJCLD).Research has shown that children at high risk who receive early school intervention show a significant improvement in their academic performance over time (Schenck et al., 1980). In addition, the early identification of reading difficulties has been shown to prevent children from needing to be classified as having a "learning disability" (de Hirsh et al., 1966; Strag, 1972). Crucially The selection of sensitive and focused assessments that are clearly linked to instructional recommendations, along with the right cut-off points for intervention access, frequent progress tracking, and ongoing training and support, are all necessary for successful early identification (Arden et al., 2017; D. Fuchs & Fuchs, 2017; Gersten, Jayanthi, et al., 2017).

1.2 Teacher's role in the identification of learning disability in school children

The first step in preventing a learning handicap in children is to identify those who have one. Teachers have a critical role to play in assisting in the identification of learning difficulties because they are frequently the child's first point of contact after starting school. Since they spend so much time with these students, teachers can be extremely helpful in evaluating these at-risk groups by observing dyslexia symptoms (Hemadharshini et al., 2020; Moharana, 2019; Shetty & Rai, 2014). It has been demonstrated that eligibility for the broad category of special education services can be strongly predicted by teacher

referral. Research indicates that between 73%to 90% of students who are referred by their classroom teachers for assessments based on their academic performance qualify for special education services (Algozzine, Christenson, &Ysseldyke, 1982; Gerber & Semmel, 1984; Gottlieb, Alter, Gotlieb, &Wishner, 1994; Harry & Klinger, 2006; Pugach, 1985; Ysseldyke, 2001). Unfortunately, most of the teachers either lack scientific understanding of this disorder or have a misconception (Peltier et al., 2022). Therefore, to diagnose dyslexia in a timely manner, teachers need to maintain a better level of awareness of the disorder. According to Charan and Kaur (2017), over half of the teachers (56.4%) in a sample of Punjabi schools had a bad attitude toward kids who had dyslexia and thought it was a justification for their laziness.

The research listed here are fewer in number and examine the effects of Indian teachers' attitudes and knowledge on the early detection of learning problems. The attitudes of primary school teachers toward inclusive education for children with particular learning difficulties in elementary schools were the subject of a 2019 study by Elizabeth K. Thomas and Seema P. Uthaman. The study's goal was to ascertain the attitudes and knowledge of 180 primary school teachers who met the inclusion requirements.

The findings showed that 51% of teachers had a positive attitude toward a student with a particular learning issue, and 63% of teachers had average understanding. It was also stated that attitudes and knowledge of teachers are significantly correlated. With the purpose to assess primary school teachers' attitudes toward students with learning disabilities, Vranda M. N. (2016) conducted a study named "Attitude of Primary School Teachers toward

Children with Learning Disabilities." The teacher Attitude about Learning Disabilities (PSTALD) scale was used to gauge the attitudes of 200 teachers in the study. The findings indicate that teachers' attitudes toward including students with learning disabilities in mainstream schools are less favorable. According to one study, regular teacher's attitudes toward disabled students are often the biggest obstacle they face at school (Agbenyega, 2007; Wall, 2002; Yu et al., 2011). These teachers view disabled students as a "disturbance" to the class, who were causing distractions, so they disregard them and devote their time to executing their lesson plans. Teachers may have the best of intentions, but they may not always be able to fully engage students with special needs in the classroom (Gerber, 1992; 213-231; Soni, 2004). However, there is no evidence of acceptance of a total inclusion (Avranides & Norwitch, 2002).

While most Indian educators are aware of the illness, their understanding of its identification is limited to modest (Kamala & Ramganesh, 2013; Shetty & Rai, 2014; Charan & Kaur, 2017; Moharana, 2019; Hemadharshini et al., 2020). The level of knowledge was found to be dependent on demographic background of the teachers such as age, education, marital status, and most importantly their teaching or training experiences (Shetty & Rai, 2014; Charan & Kaur, 2017). In India, learning disabilities are not widely recognized, with even education directors reportedly questioning their existence. The notion of learning disability is inherently complex, which is further complicated by the severe lack of teacher awareness, assessment protocols or indigenous tools for the assessment of processing deficiencies, IQ testing, and testing for reading and writing proficiency (Karanth, 2002).Limited training in reading assessment

forces teachers to rely on trial-and-error methods (Mirchandani & Sundaram, 2006).Given the current limitations in assessment practices, a collaborative approach incorporating Speech-Language Pathologists (SLPs) alongside teachers is essential to optimize early identification of learning disabilities.

1.3 Collaboration of SLPs and teachers in the identification of Learning Disability

In the ideal scenario, SLPs and teachers should work together to implement early identification. It is frequently encouraged that teachers participate in the SLP screening process in order to increase the screening's accuracy (Fujiki & Brinton, 1984; Marsh et al., 2006; Patterson & Wright, 1990; Whitworth et al., 1993). School-based speech-language pathologists often use screeners to determine if an evaluation is warranted, and teacher involvement is typically advocated as part of the screening process (Fujiki & Brinton, 1984; Marsh, Pane, & Hamilton, 2006; Whitworth, Davies, Stokes, & Blain, 1993). Thereby, it is encouraged the participation of teachers in the SLP screening process to increase the accuracy of screening (Fujiki & Brinton, 1984; Marsh et al., 2006; Patterson & Wright, 1990; Whitworth et al., 1993).Having a speech-language pathologist evaluate each kindergarten student comes at a significant cost. If teacher ratings are a good way to determine who needs to be suggested, then they might offer a less expensive choice. There has been a claim made that the clinical setting in which speech-language pathologists' work undermines their ability to work closely with teachers to create intervention plans customized for each student as well as appropriate goals and activities for

students in their classrooms. Most of the time, this is because their own interests play a major role in influencing their involvement with reading disabilities, which limits the effectiveness of intervention (Nirupama and Karanth, 2003).

1.4 Phonological skills and oral language skills as an early predictor of literacy skills

When reading becomes the main academic focus in formal education, early literacy abilities are developed throughout the first five years of life. Early skills, such as phonological awareness (e.g., rhyming, alliteration), vocabulary, letter naming, and word manipulation (e.g., word blending, word segmenting), are strongly related to the ability to use phonics later, and are precursory skills for learning to read successfully (Adams, 1990; Hart & Risley, 1995; Snow et al., 1998). Furthermore, a variety of early literacy abilities, including expressive and receptive language, comprehension of print concepts, linguistic awareness, letter-sound correspondence, emergent writing abilities, and alphabetic principles, all contribute to the development of reading to varying degrees (Snow et al., 1998). These abilities work together to lay the groundwork for reading. Further skills can be learnt more quickly and effectively the earlier these core skills are mastered. Young children progress through a period of emergent literacy during which they develop the rudimentary skills, knowledge, and attitudes that prepare them for the acquisition of conventional literacy (Sulzby, 1989; Teale, 1986; Teale &Sulzby, 1986; Wells, 1985).

Phonological awareness is a skill, which starts to develop during the preschool period, can be developed and taught, cannot develop on its own, is a determinant of reading-writing problems and has an important role effect in reading-writing achievement in the future (Catts, Gillispie, Leonard, Kail, & Miller, 2002; Chard & Dickson, 1999; Ege, 2006; Olofsson &Niedersoe, 1999; Phillips, Menchetti, & Lonigan, 2008; Pullen & Justice, 2003; Roskos, Christie, &Richgelds, 2003; Torgesen et al., 1992; Rubba, 2004; Torgesen & Wagner, 1998).It was mentioned that there was a relationship between the phonological awareness and reading, writing development in the studies carried out (Stahl & Murray, 1994). The hypothesis that the children who are successful in phonological awareness related tasks are more advantageous in learning how to read is generally accepted (Nation & Snowling, 2004). There are also some studies indicating that the phonological awareness skill measured in preschool period children is the descriptor of writing achievement (Abbott & Berninger, 1993).

Moats (1994) had stated lower-level language mastery is as essential for the literacy teacher as anatomy is for the physician. All teachers of elementary grades face the task of teaching children to read and write, therefore, teachers need to have knowledge about the language elements and how these elements are represented in writing. For e.g., teachers need to know the alphabetic principle, phoneme-grapheme correspondences, and how the language is constructed. In addition, teachers need to be able to implement a variety of activities in classroom instruction of PA. Lacking teachers with adequate knowledge of the language structure is a crisis in education. Teachers must be

prepared with adequate knowledge, be able to apply this knowledge to tasks of PA and a variety of instructional strategies to teach PA. This is because phonemic awareness is the result of direct and explicit instruction and not age or maturation. Moats and Foorman in the year 2003, stated only a few studies have documented what teachers know about language and reading and how they practice their knowledge in teaching reading to youngsters.

Dickinson and Tabors (1991) and Snow, Tabors, Nicholson, and Kurland (1995) found that the semantic skill of formulating definitions was the oral language variable that was most highly correlated with their emergent literacy measure, a composite measure that included phonological awareness (initial and final sound identification) in both kindergarten and 1st grade. The two spoken language evaluations, receptive vocabulary and listening comprehension, did not reveal any significant differences. The metalinguistic abilities of 3- and 4-year-old toddlers were shown to be strongly correlated with both of their language measures (receptive vocabulary and syntactic comprehension), even after accounting for age effects. Consequently, research has shown a connection between highly developed structural language skills and phonological awareness.

Research shows that early childhood oral development can positively or negatively influence a child’s ability to learn language and develop literacy skills (Clay, 2015a; Lindfors, 1987).Language structures provide the groundwork for children's reading instruction. Therefore, the literacy curriculum for young children must include the child's use of oral language.

They benefit from their own oral language as they experiment with new concepts and become more adept readers. The young learner's foundation in oral language is crucial. Children entering elementary school already understand how to use language and that language has patterns (Halliday, 1975). Lindfors (1987) explains that the mastery of oral language controlled by children when they enter kindergarten is basic to all their future learning.

There are numerous studies regarding knowledge and awareness of phonological skills among teachers. Sana (2005) found out that in general, teachers demonstrated low levels of knowledge and skills in phonological skills regardless of their training and whether they teach regular or special needs students. There are supporting studies done by few other investigators. Bos & Chard (2001) stated that even though teachers might have received some training in phonological awareness, many still showed significant gaps in their knowledge and instructional skills. The study done by Brady et al (2009) revealed that many teachers lacked a deep understanding of phonological awareness concepts and their importance in reading instruction. The study highlighted that "teachers, irrespective of their training, often demonstrated limited ability to apply phonological awareness in classroom instruction," indicating a need for more comprehensive and practical training programs. In addition to this Hindson et al. (2005) concluded that even after participating in professional development programs, a considerable number of teachers did not demonstrate adequate proficiency in phonological awareness instruction.

1.5 Biliteracy and bilingual education system of India

India has been characterized as a sociolinguistic giant (Pandit, 1972) whose nerve system is multilingualism (Annamalai, 1986). The high prevalence of bilingualism and multilingualism among Indians has both opportunities and challenges for educators. Apart from the state schools and private schools, there are 500 central schools with bilingual medium (English and Hindi). Although the primary and higher primary education system promotes multilingualism in children, the system of higher education does not promote multilingualism in India (Sharma, 2001), since English is the medium of education for many of the higher education courses including professional courses.

The multitude of languages and dialects, the variety of school systems, the disparities in curricula and their practices, and the inadequacies in teacher preparation programs and instructional methodologies all contributed to the need for an update of the national education policy. As a result, the Indian government provided a number of educational policies throughout the latter part of the 20th century, taking into consideration the diverse child population. In an educational setting, a language that is learned after one's first or native tongue has become fairly well-established is called a second language.

Specific Learning Disabilities have been included in the disability category of the Rights of Persons with Disabilities (RPWD) Act in India (2016) necessitating the early identification, assessment, diagnosis and certification of vulnerable children (The Gazette of India Extraordinary, 2018) to enable early

intervention. However, the certification of disability in SLD is often subjective and equivocal, creating confusion for clinicians and certifying boards (John, 2020).

All teacher education programs will include teaching on how to teach children with specific disabilities under the New Education Policy. The Union Cabinet of India approved the NEW School Policy (NEP) 2020 in July 2020, and its LATEST PROVISION advocates for "Barrier-free access to Education for all Children with Disabilities". India established its first education policy in 1986, and it underwent its most recent revision in 1992. Since then, India's entire education policy has required revision. The eagerly anticipated new reforms that India was seeking are outlined in the New Education Policy. Children from low-income families and those with disabilities are given special consideration in the design of these adaptations. Crucially, the NEP promotes providing required attention to children with learning difficulties through employing appropriate diagnostic methods and technology to address their needs.

The All-India Council for Education approved the Three Language Formula (TLF) in September 1956, and state governments were given the authority to put it into effect while adhering to the union government's general guidelines and constitutional protections. The three-language formula in India mandates teaching students their state's language, a modern Indian language, and English for comprehensive linguistic education.

Since children in India must study in a language other than their native tongue due to the country's multilingual social background, the educational system is complicated and multi-tiered, making it nearly impossible to estimate the prevalence of learning disabilities and exceedingly difficult to diagnose. Although the benefits of educating a child using multiple languages are many, the multilingual and the multi-orthographic systems prevalent in India pose fundamental issues in assessing children with special needs (Ramaa, 2000: 268-283). While assessing the development of auditory comprehension of language structure, lexical and grammatical, it is observed that one category of function words does not develop before another; rather auditory comprehension of language structure depends on the particular linguistic structure, its referent, and frequency of use (Carrow, 1968: 99-111). Simultaneous exposure to three languages can be challenging even for a typically developing child, and even more so for a child with a learning disability, since children's mother tongue, the language spoken in a particular state, and the medium of instruction in schools can all differ.

1.6 Assessing Learning Disability in classrooms

The Rhode Island Prek-12 literacy policy (2005) have put forward the types of assessment that can be done within a classroom. They are as follows:

i. Screening assessment: This determines which students are most likely to have reading difficulties and who is at-risk for the disorder and need more interventions, additional diagnostic testing, or either.

ii. Diagnostic assessment: The diagnostic examination furnishes more comprehensive data regarding a student who has been designated as "at-risk" at any point throughout the academic year.

iii. Progress monitoring assessment: This provides timely information to teachers about the progress of students and determines if the student is making adequate progress or not.

Under this type of assessment, Classroom level progress monitoring known as Curriculum embedded assessments are included. They consist of ongoing exercises that are commonly utilized in the teaching process. They direct the specifics of instruction within the curriculum and evaluate students' learning through systematic observation. Research studies have reported that the teachers utilize summative assessments than the formative assessments for assessing reading comprehension in students, even though, they consider the reading assignments and class tests to evaluate students' reading abilities and progress. Reading assessment in English language instruction includes assessing students' comprehension, general reading ability, informative and argumentative reading skills, reading techniques, and recreational reading (Richek et al., 2009). In this regard, formative assessment is acknowledged as being more advantageous than summative assessments during the learning process. According to a recent argument by Perera-Diltz and Moe (2014), formative assessments enable teachers improve their teaching strategies and track their students' progress toward academic standards. Therefore, rather than depending exclusively on summative exams, it is advised that teachers incorporate formative assessments into their lesson plans. This method fosters each student's unique development, interests, and learning needs by

encouraging them to actively engage in reading through dialogues, role-plays, narrative, and summaries.

1.6.1 Curriculum-based assessment

A more accurate method of evaluating the academic achievement of children with learning disabilities in the class is the curriculum-based assessment, sometimes referred to as the progress monitoring assessment. Curriculum-based assessments are examinations whose criteria are usually derived from the subjects the student is expected to study in school. Formal assessments include spelling bees, multiple-choice tests designed to determine how well students have retained the material given in Social Studies classes, and exams designed to evaluate the substance of chapters in mathematics text booksThe primary advantage of curriculum-based assessment is that, by using context-based assessment approaches, it gives teachers the ability to continuously evaluate their students' progress in the classroom and measure their performance in relation to customized benchmarks. This particular kind of assessment is student-centered, tracks each student's progress in connection to both personal and classroom goals, and concentrates on the individual learning needs and skills of each student. Teachers can now swiftly identify obstacles and send children for support services like tutoring and special education evaluation rather than waiting for test results. Additionally, this encourages early intervention and better results for students with learning disabilities.

While the school curriculum is a criterion-based assessment for SLD (Ahmad, 2015), it lacks standardization in the assessment of children (meaning

two children of the same age and class might be assessed using different content and test items depending on the type of school, examination board, and the state they belong to). Moreover, establishing the equivalentity of test items in the local language and English is difficult, which leads to the creation of an arbitrary evaluation procedure.

1.7 Currently available tools used to identify LD in India

A number of tools have been created to help teachers and other professionals in screening children who may have learning disabilities. Fewer of those tools are discussed here. Dyslexia Assessment for the Languages of India, known as DALI was developed by Singh et al. (2015) and her colleagues of the National Brain Research Centre along with the support of the Government of India (Cognitive Science Initiative, Department of Science and Technology), is the first promising tool standardized for lower grades students (class 1-5) (Mather et al., 2020). It is designed to screen and assess dyslexia in struggling readers of Kannada, English, Hindi and Marathi languages by teachers and psychologists respectively (Mather et al., 2020; Raman et al., 2020; Sahu et al., 2022). According to Rao et al. (2021), Dyslexia Assessment Battery (DAB) of DALI (DALI-DAB) evaluated reading (word decoding, reading comprehension, spelling) and mediator skills (oral language, phonological awareness, processing automaticity, executive function) for assessing dyslexia in bilingual children. Curriculum-based measurement (CBM) is another assessment approach that helps to recognize children who demand for special education (Fore III et al., 2006) and device appropriate individualized

educational plans for them (Deno et al., 1984). Previous literatures have reported its effectiveness and mentioned its positive implications towards screening poor readers or readers with dyslexia in different countries like Arab (Abu-Hamour et al., 2013; Mahfouz & Mohamed, 2023), Germany (Voß& Blumenthal, 2020), Spain (Gutiérrez et al., 2019) and USA (Nelson et al., 2019). However, there was not a single CBM tool created in India that could be utilized with Indian students. CBM tools which were designed by western were used with minor changes to evaluate reading impairments among school children in India (Shenoy et al., 2020). Recently, a digital CBM tool named as Fluency Assessment for Benchmarking in Literacy education (FABLe) was developed for the first time in India to identify children who are at higher risk of having dyslexia (Misquitta et al., 2023).It assesses children based on their oral reading proficiency in order to provide appropriate assistance.

Another test material currently available in India, to identify children with learning disability is NIMHANS Index. National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore has invented this tool to diagnose children (5-12 years) suffering from one more type of learning disabilities (Kapur et al., 2002). This is the most recommended test in India due to its approval from the Government of India (Nair et al., 2017; Scaria et al., 2023). It is free of cost and available in English, Hindi and Kannada languages (Sahu et al., 2022). It examines a child's visual-motor skills, auditory and visual functioning, skills for reading, writing, spelling and comprehension, mathematical power and encompasses assessment tests for attention, speech, language, auditory behavior, and verbal expressions (Nisha & Kumar, 2013).

Grade Level Assessment Device (GLAD) is an assessment device, developed by the National Institute for the Mentally Handicapped (NIMH) to assess school children (6 years or above) having learning deficit based on their curriculum activities (Nair et al., 2017). In addition, it is free of charge and accessible in both Hindi and English. Dyslexia screener is a computer-based assessment is meant to assist educators in identifying pupils who may have dyslexia. Every age group can use this tool. As a preliminary diagnostic instrument, it helps educators differentiate between dyslexia and poor reading proficiency and provides guidance for the future.

Although there are many ways to identify children who may be at risk for learning disabilities, the development and validation of identification tools, identification criteria, reasons why a specific learning disability occurs, the identification of co-occurring deficits in an individual along with learning disabilities, the implications of learning disabilities on an individual's intellectual functioning, educational, personal, and social lives, the likely causes of the deficit, the necessity and applicability of specific interventions, and the impact of remediation on an individual with learning disabilities seem to be the main challenges in the identification and assessment of learning disabilities.

To rule out whether the child's learning difficulties is due to a learning disability or poor competency in the school language, assessment is crucial. (Ramaa, 2000). Furthermore, the standardized achievement exams utilized in India are one-time jobs that lack update because there is no credential body of experts and inadequate funds for periodic changes about their usability,

reliability, validity, and norms across the nation's states. Furthermore, it is difficult to find ready-made, standardized assessment tools in all the languages needed for the multilingual social milieu of the country. Indigenous, language-based reading assessment tests should be used that are sensitive to the characteristics of each language and its script specific features since reading processes depend on the nature of language and its script-specific features (Prema & Karanth, 2003).

Dickinson (2001) developed a teacher designed questionnaire titled 'Teacher rating of oral language and literacy' (TROLL) as a motive to provide the teachers a way to track the language and literacy development of children in their classrooms. TROLL was created with the idea that it is essential to assess each child's level of speaking, listening, reading, and writing in order to give developmentally appropriate education to all primary school-aged children. It was created to give teachers the ability to examine a student's literacy-related abilities and characterize their interests in language and literacy, something that can't be performed with a direct assessment tool.

Dickinson (2001) stated that this tool has high internal consistency, which was found out through one study where teachers rated 272 children twice and compared their ratings. Research demonstrated that students who performed well on the TROLL the first time also performed well on the second try, even though teachers weren't access to their previous assessments. Dickinson & Chaney (1997) reported that the teacher ratings of children's language and literacy development on TORLL show moderate associations with

children's scores on few other direct assessments, including well-established Peabody Picture Vocabulary Test (PPVT-III) and measures of emergent literacy and early phonological awareness.

Research findings stating the relationship between TROLL and other standardized assessment to identify language and literacy skills of children are mentioned here. Dickinson et al (2003) reported that TROLL scores demonstrate a moderate associations between the children's scores on three measures of language and literacy skills(language, reading and writing) with Peabody Picture Vocabulary Test-III (PPVT-III; Dunn &Dunn, 1997), which measures receptive vocabulary, with Emergent Literacy Profile (ELP; Dickinson & Chaney, 1997) assesses children's ability to read environmental print and with Early Phonemic Awareness Profile (EPAP; Dickinson & Chaney, 1997) which assesses children's ability to engage in phoneme deletion. Rodriguez and Guiberson (2011) found out a significant relationship between preschool teacher's ratings of children's language and literacy skills, based upon the TROLL and children's performance on a standardized measure of expressive and receptive language skills on Preschool Language Scale -4 (PLS-4) (Zimmerman, 2002). Gregory (2015) conducted a study on validating teacher's ratings for screening children's language skills using TROLL (Dickinson et al., 2001), Communication Checklist-2 (CCC-2; Bishop, 2006), Dynamic Indicators of Basic Early Literacy Skills Next (DIBELS Next; Good, Gruba, & Kaminski, 2009), and Diagnostic Evaluation of Language Variation: Screening Test (DELV-ST; Seymour, Roeper, & de Villiers, 2003). It was found out that TROLL showed high correlations with the CCC-2, DIBELS, and DELV-ST, indicating it's potential to identify learning disabilities in children.

Overall, the strong correlations between these screening tools indicate that a combination of assessments, including teacher ratings (TROLL and CCC-2) and standardized tests (DIBELS and DELV-ST), can provide a comprehensive approach to identifying learning disabilities in children, particularly in the areas of oral language, literacy, and communication skills.

There are numerous advantages for using TROLL compared to other assessment tools. TROLL requires no formal training, making it accessible for classroom teachers to efficiently monitor students' language and literacy progress in just 5–10 minutes, seamlessly integrating into daily classroom routines with minimal preparation. It can be easily integrated into normal classroom procedures. It covers all critical skill teachers need to know about early reading and writing. Teachers can evaluate a child's proficiency in both English and their native tongue by asking introductory questions that determine the child's languages spoken as well as their English comprehension and production skills. Unlike formal assessments prone to fluctuations in performance, TROLL relies on teachers' professional judgment, ensuring consistency in ratings compared to formal testing outcomes.

Several preliminary research results support the notion that the TROLL evaluation is a potentially useful method for identifying children who may have learning disabilities. The questionnaire TROLL consists of domains language use, reading and writing. Along with these domains, phonological awareness got included in the modified version M-TROLL. Along with this addition, performance of the children in each of the questions were assessed for both

Kannada and English. Hence, the total number of questions in modified version M-TROLL appeared to be 27 and the minimum and maximum scores that children can score falls onto 54 and 212, respectively. However, further research is imperative to verify the accuracy and effectiveness of the modified version, M-TROLL (Thankam &Shanbal, 2011). The present study addresses this gap in knowledge by outlining a comprehensive study to assess the validity of the M-TROLL (Thankam &Shanbal, 2011) to identify children who are at risk for learning disabilities.

CHAPTER III

METHOD

The primary aim of the current study was to evaluate and compare the assessment score given by teachers and Speech-Language Pathologist (SLP), on a teacher rating questionnaire, developed by Dickinson (2001), which was modified by Thankam and Shanbal (2011) and to investigate the correlation between specific domains on the M-TROLL (Thankam &Shanbal, 2011) and ELST (Goswami &Shanbal, 2009) based on their respective scores.

3.1 Research Design

The present study followed a descriptive and correlational research design, wherein the performance of teachers and SLP on M-TROLL, were compared.

Ethical considerations: The study was conducted adhering to the AIISH ethical committee guidelines for Bio-Behavioral Sciences for Human Subjects (AEC, 2009). The teachers were informed about the study and its objectives before the commencement of field testing, and their agreement to participate was acquired through signing a consent form.

3.2 Participants

The participants of the study comprised a total of thirty teachers and thirty children within an age range of 5-7 years, studying in first standard, identified by their teachers as having poor academic performance.

3.2.1 Inclusionary Criteria

(a) All children attended mainstream schools, was raised in an urban Karnataka milieu, spoke Kannada as their first language, and was exposed to the English language.

(b) The children with normal hearing acuity and normal/corrected vision were included in the study.

(c) All the children were screened and ruled out for any speech, language and hearing issues using theWHO Ten-Question Disability Screening checklist (mentioned in Singhi, Kumar, Prabhjot, & Kumar, 2007).

(d) The teachers who served as the primary instructors and head of their assigned classroom, possessing a minimum of six months experience in direct student engagement, were included in the present study.

3.2.2 Exclusionary Criteria

Children with a history of syndromic disorders or any other related issues, such as sensory or neurological issues, were excluded from participating in the study.

3.3 Procedure

The study was carried out in the following phases:

Phase 1: Content validation of M-TROLL (Thankam &Shanbal, 2011) by two Speech-Language Pathologists and one Special-educator.

Phase 2: Administration of M-TROLL (Thankam &Shanbal, 2011) on selected children by teachers and Speech-Language Pathologist.

Phase 3: Evaluating the difference between the groups.

Phase 4: To assess the concurrent validity.

Phase 1: Content validation of M-TROLL

The M-TROLL (Thankam &Shanbal, 2011) was subjected for the content validation, by three professionals including two Speech-Language Pathologists and one special educator, who were possessed with an experience of more than 3 years in field of learning disability. The content validation was carried out with 4-point rating scale developed by Shylaja (2019), which included Likert scale ranging from 1 (not at all appropriate) to 4 (most appropriate). The professionals were asked to rate each question across each of the four domains (Language use, Phonological awareness, Reading, and Writing) on M-TROLL, on following scales:

‘4’ – Most appropriate

‘3’- Appropriate

‘2’- Appropriate to some extent

‘1’- Not at all appropriate

The total rating of (two speech-language pathologists and one special educator)

professionals based on above-mentioned scale under each domain o M-TROLL, is as follows:

Language use*:* Under this domain, seven questions were coming in total. There was a mixed opinion about the questions under language domain. One SLP, rated three questions as appropriate (score:3), which was rated as most appropriate (score:4) by another SLP. Remaining four questions were rated as most appropriate (score:4) by both SLPs. The Special educator rated the all seven questions, under this domain as most appropriate (score:4).

Phonological awareness*:* There were five questions in total, under this domain. Both the SLPs rated most appropriate (score:4) to all the five questions. The special educator rated most appropriate (score:4) to three questions and rated appropriate (score:3) to other two questions.

Reading*:* Eight questions were there, in total, under this domain. Both the SLPs and the special educator rated seven questions among the eight questions, as most appropriate (score:4) and one question as appropriate (score:3).

Writing: There was total six questions, under this domain. All the three validators, rated most appropriate (score:4) to all the six questions.

Phase 2: Administration of M-TROLL (Thankam & Shanbal, 2011) on selected children by teachers and Speech-Language Pathologist.

The M-TROLL (Thankam &Shanbal, 2011) questionnaire was provided to the teachers, to administer on the selectedchildren between age ranges of 5-7 years, studying in first standard. Before the administration of teachers, the SLP provided instructions to teachers on how to conduct the administration.

Following the administration of M-TROLL (Thankam &Shanbal, 2011) by teachers, the SLP also administered the M-TROLL (Thankam &Shanbal, 2011) to the same group of children. This process was carried out within the school settings.

Phase 3: Evaluating the differences between the two groups

The mean score and standard deviation of each domain on M-TROLL (Thankam &Shanbal, 2011), administered by teachers and SLP on the same population were obtained. The scores were subsequently compared, and evaluated for any significant differences.

Phase 4: To assess concurrent validity

The Speech-Language Pathologist administered ELST (Goswami & Shanbal, 2009) on the same children, within the school settings. Following that, a correlation analysis was conducted on the assessment scores of specific domains that were similar between the ELST (Goswami &Shanbal, 2009) and M-TROLL (Thankam &Shanbal, 2011), to assess the concurrent validity. The domains taken for the analysis for M-TROLL included language use, phonological awareness, reading and writing. The domains taken for the analysis for ELST included oral language skills, phonological awareness, reading skills and writing skills.

Scoring, interpretation and analysis

The total assessment scores on the questionnaire M-TROLL (Thankam &Shanbal, 2011) done by teachers, SLP and the scores under each domain on M-TROLL (Thankam &Shanbal, 2011) administered by teachers, SLP and the scores under each domain on ELST (Goswami &Shanbal, 2009) done by SLP were obtained. The M-TROLL (Thankam &Shanbal, 2011) and ELST (Goswami &Shanbal, 2009) was administered by both teachers and SLP individually on each child. Statistical analysis was carried out using SPSS-Statistical Package for Social Sciences Version 26.0(IBM Corp., 2019). Descriptive statistics was done to obtain mean and standard deviation. Paired t-test analysis was done to analyse the significant difference between the total score on M-TROLL (Thankam &Shanbal, 2011), administered by teachers and speech-language pathologist. Spearman's correlation analysis was done to find the correlation between total scores of domains on M-TROLL (Thankam &Shanbal, 2011) and ELST (Goswami &Shanbal, 2009).

CHAPTER IV

RESULTS

The primary aim of the current study was to validate the teacher designed questionnaire M-TROLL, to identify children at risk for learning disability. The first objective of the present study was to evaluate and compare the score among teachers and SLPof M-TROLL, which is a teacher rating questionnaire, developed by Dickinson (2001) and modified by Thankam and Shanbal (2011). The second objective of the present study was to study the relationship between the M-TROLL (Thankam & Shanbal, 2011) and ELST (Goswami &Shanbal, 2009).Participants in this study were thirty teachers and thirty first-grade students,ages between five and seven years old. The selected children were native Kannada speakers, who had regular exposure to English within their school curriculum and were enrolled in the schools employing similar teaching methodologies.The teachers, who served as the primary instructor of the children, with at least six months of direct teaching experience with them, were enrolled in the study and provided with the questionnaires. The scores obtained on the M-TROLL (Thankam &Shanbal, 2011) by teachers, SLP and the scores on ELST by SLP, for each child were obtained. The domains on M-TROLL (Thankam &Shanbal, 2011) such as language use, phonological awareness, reading and writing (first, second, third and fourth sections) contained 7, 5, 9 and 6 items respectively.

Statistical analysis was carried out using SPSS- Statistical Package for Social Sciences Version 26.0 (IBM Corp., 2019).When the data was subjected to the Shapiro-Wilk test of normality, it appeared that the distribution of the data

was not normal ($p>0.05$). Hence, non-parametric tests were carried out.

The statistical analysis of data was done using the following statistical procedures:

i) Descriptive statistics was done to obtain mean and standard deviation of M-TROLL (Thankam &Shanbal, 2011) assessed by teachers and SLP.

ii) Paired t-test analysis was done to analyse the significant difference across the total score of M-TROLL by teachers and SLP.

iii) Spearman's correlation analysis was done to find the correlation between total scores and scores of domains in M-TROLL (Thankam &Shanbal, 2011) and ELST (Goswami &Shanbal, 2009).

The results of the current study are elucidated under the following sections:

4.1 Performance of teachers and SLP on M-TROLL.

4.2 Relationship between the M-TROLL scores with ELST.

4.1 Performance of teachers and SLP on M-TROLL

Under this section, the results are reported based on the performance of teachers and SLP on the administration of M-TROLL (Thankam &Shanbal, 2011) to the same group of children. Hence, the subsection under this is as following:

4.1.1 Results on administration of M-TROLL by teachers.

4.1.2 Results on administration of M-TROLL by SLP.

4.1.3 Comparison between the performance of teachers and SLP on the administration of M-TROLL.

4.1.1 Results on administration of M-TROLL by teachers

The teachers were informed to administer the M-TROLL (Thankam &Shanbal, 2011) on each child, and the total raw score obtained by all the children on all four domains were calculated, separately. Descriptive statistics was computed for the data and the results for mean, median, SD and Inter-quartile (IQR) range were derived. Table 4.1 shows the mean, median, SD and IQR for the total score and the scores of 4 domains on M-TROLL (Thankam & Shanbal, 2011) by teachers and SLP.

Table 4.1

Mean, Median, SD and IQR range for overall assessment scores on all the 4 domains on M-TROLL by teachers and SLP (N=30).

	Mean	SD	Median	IQR
MT-T	110.06	23	113	38.50
MT-SLP	110.50	23.51	114.50	37.75
MTL-T	27	6.61	26.5	11.25
MTL-SLP	27.6	6.94	27	12
MTP-T	24.06	5.84	24	8.50
MTP-SLP	24.06	5.61	23.5	8.25
MTR-T	35.36	9.20	36.5	15.75
MTR-SLP	34.76	8.90	36	15
MTW-T	23.66	5.45	23.5	7.25
MTW-SLP	24	5.38	24	6.25

Note: MT-T= M-TROLL by teachers; MT-SLP=M-TROLL by SLP; MTL-T= language use on M-TROLL by teachers; MTL-SLP= language use on M-TROLL by SLP; MTPT=phonological awareness on M-TROLL by teachers; MTP-SLP= phonological awareness on M-TROLL by SLP; MTR-T= reading on M-TROLL by teachers; MTR-SLP= reading on M-TROLL by SLP; MTW-T= writing on M-TROLL by teachers; MTW-SLP=writing on M-TROLL by SLP.

Analysis of results as shown in Table 4.1 indicated that the mean and SD for total scores for teachers on the M-TROLL was 110. 07 ± 23, respectively. The analysis of results showed a mean and SD for the language use on M-TROLL by teachers to be 27±6.61, respectively. The mean and SD of the phonological awareness on M-TROLL by teachers was found to be 24.06± 5.84. The mean and SD for reading and writing on M-TROLL, by teachers was found to be 35. 36± 9.2 and 23.67±5.45 respectively.

4.1.2 Results on administration of M-TROLL by SLP

The SLP administered M-TROLL on each of the thirty children and the total raw scores obtained by all children on all four domains of M-TROLL were calculated, separately. Descriptive statistics was computed for total scores. The mean and SD obtained for total score on M-TROLL by SLP obtained was 110.50 ± 23.5, respectively (Table 4.1). The mean and standard deviation of the language use on M-TROLL by SLP was found to be 27±6.94. The mean score and standard deviation of Phonological awareness on M-TROLL, by SLP was found to be 24.06± 5.61. The mean score and standard deviation of the domain reading and writing on M-TROLL, by SLP was found to be 34.76± 8.9 and 24 ±5.38, respectively.

4.1.3 Comparison between the performance of teachers and SLP on the administration of M-TROLL

Analysis of results in the Table 4.1 for the comparison of total scores between teachers and SLP on M-TROLL revealed a lower score for teachers

(Mean=110.06, SD=23) when compared to SLP (Mean=110.50, SD=23.5). The table 4.2 shows the comparison of performance between teachers and SLP on M-TROLL using Paired t-test. The analysis of results on paired-test (Table 4.2) revealed that there was no significant difference between teachers and SLP on total scores for M-TROLL [t (29) = -1.160, p>0.05].

Table 4.2

Comparison of performance between teachers and SLP on M-TROLL using Paired t-test

Domain		**t**	**df**	**Sig. (2-tailed)**
Total score	MT-T & MT-SLP	-1.160	29	.255
Language use	MTL-T &MTL-SLP	-2.068	29	0.048*
Phonological awareness	MTP-T & MTP-SLP	.000	29	1.000
Reading	MTR-T& MTR-SLP	2.097	29	0.045*
Writing	MTW-T& MTW-SLP	-1.123	29	0.271

*p<0.05

Note: MT-T=M-TROLL by teachers; MT-SLP= M-TROLL by SLP; MTL-T= language use on M-TROLL by teachers; MTL-SLP= language use on M-TROLL by SLP; MTP-T= phonological awareness on M-TROLL by teachers; MTP-SLP= phonological awareness on M-TROLL by SLP; MTR-T= reading on M-TROLL by teachers; MTR-SLP= reading on M-TROLL by SLP; MTW-T= writing on M-TROLL by teachers; MTW-SLP= writing on M-TROLL by SLP.

Analysis of results on the language use (Table 4.1) revealed lower scores for M-TROLL by teachers (Mean= 27; SD=6.61) when compared to SLP (Mean=27.6; SD=6.94). Further the table 4.2 shows analysis of results on paired t-test which revealed that there was a significant difference for the results on

language use between teachers and SLP [t (29) = -2.068, p<0.05].

Analysis of results on the phonological (Table 4.1) revealed similar scores for administration of M-TROLL by teachers (Mean= 24.06; SD=5.84) and SLP (Mean=24.06; SD=5.61). Further the table 4.2 shows analysis of results on paired t-test which revealed that there was no significant difference for the results on phonological awareness between teachers and SLP [t (29) = 0.000, p>0.05]. Analysis of results on reading (Table 4.1) revealed higher scores for M-TROLL by teachers (Mean=35.36; SD=9.20) when compared to SLP (Mean=34.76; SD=8.9). Further the table 4.2 shows analysis of results on paired t-test which showed that there was a significant difference for the results on reading between teachers and SLP [t (29) = 2.097, p<0.05].

Analysis of results on writing (Table 4.1) revealed lower scores for M-TROLL by teachers (Mean= 23.66; SD=5.45) when compared to SLP (Mean=24; SD=5.38). Further the table 4.2 shows analysis of results on paired t-test which revealed that there was no significant difference for the results on reading between teachers and SLP [t(29)= -1.123, p>0.05].

4.2 Relationship between M-TROLL and ELST by teachers and SLP

The results are reported based on the scores of children, across each domain on M-TROLL and ELST by teachers as well as SLP. Spearman's correlation was computed to measure the relationship between the such as language use on M-TROLL and oral language skill on ELST, phonological

awareness on M-TROLL and phonological awareness on ELST, reading on M-TROLL and reading skill on ELST, and writing on M-TROLL and writing skill on ELST. The Spearman correlation coefficient was suggested, since the variables across M-TROLL and ELST, were not normally distributed. Therefore, the subsections under this section are as follows:

4.2.1 Correlation between language use (on M-TROLL) and oral language skill (on ELST).

4.2.2 Correlation between phonological awareness (on M-TROLL and ELST).

4.2.3 Correlation between reading (on M-TROLL) and reading skills (on ELST).

4.2.4 Correlation between writing (on M-TROLL) and writing skills (on ELST).

4.2.1 Correlation between language use (on M-TROLL) and oral language skill (on ELST).

Table 4.3 shows the Spearman's correlation coefficient between language use on M-TROLL by teachers, SLP, and oral language skills on ELST by SLP. Figure 4.1 shows the scatter plot for correlation between language use on M-TROLL by teachers and oral language skills on ELST by SLP and Figure 4.2 shows the scatter plot for correlation between language use on M-TROLL by SLP and oral language skills on ELST by SLP.

Table 4.3

Spearman's correlation coefficients between language use on M-TROLL by teachers, SLP and oral language skills on ELST by SLP.

		MTL-T	MTL-SLP	ETOL-SLP
MTL-T	Correlation Coefficient	1.000	0.951**	0.415*
	Sig. (2-tailed)	.	0.000	0.023
MTL-SLP	Correlation Coefficient	.951**	1.000	0.458*
	Sig. (2-tailed)	.000	.	0.011
ETOL-SLP	Correlation Coefficient	.415*	0.458*	1.000
	Sig. (2-tailed)	0.023	0.011	.

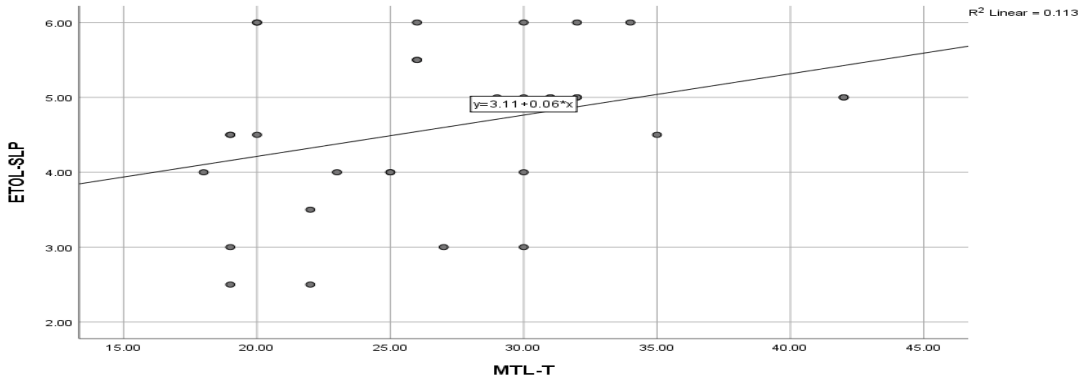
**p<0.05; **p<0.01*
Note: MTL-T = language use on M-TROLL by teachers; MTL-SLP = language use on M-TROLL by SLP; ETOL-SLP = oral language skill on ELST by SLP.

The results from Table 4.3 show spearman's correlation coefficient, which indicates a significant correlation [r= 0.415, p= 0.23] between the language use on M-TROLL by teachers with oral language skills on ELST by SLP. Also, the analysis of results from Table 4.3 shows the Spearman's correlation coefficient which indicated that there is a significant correlation [r= 0.458, p= 0.011] between the language use on M-TROLL by SLP and oral language skills on ELST by SLP. Therefore, higher scores in the language use of M-TROLL, correspond to higher scores in Oral language skills on the ELST. Hence, it has been identified that children who performed well on the language

use on M-TROLL also performed similarly on the oral language skill on ELST.

Figure 4.1

Scatter plot for correlation between language use on M-TROLL by teachers and oral language skills on ELST by SLP

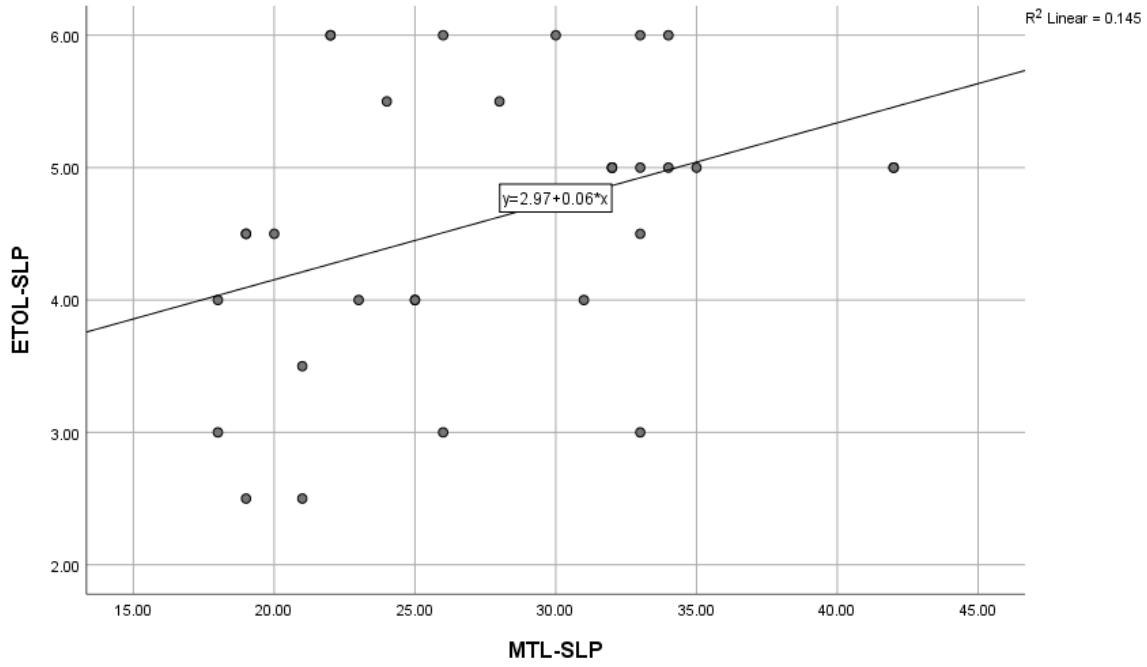


Note: MTL-T = language use on M-TROLL by teachers; ETOL-SLP=oral language skill on ELST by SLP.

As shown in the above Figure 4.1, each point corresponds to a pair of scores of language use on M-TROLL by teachers and oral language skill on ELST by SLP. The language use domain scores vary from 15 to 45, whereas the oral language skill domain scores vary from 2 to 6. The regression line equation is y=3.11 + 0.06x and has an R-squared (R^2) value of 0.113. Thereby it was found that there is a moderate positive correlation between the MTL-T and ETOL-SLP.

Figure 4.2

Scatter plot for correlation between language use on M-TROLL by SLP and oral language skills on ELST by SLP



Note: MTL-SLP= language use on M-TROLL by SLP; ETOL-SLP=oral language skill on ELST by SLP

As indicated in the above Figure 4.2, each point corresponds to a pair of scores of language use on M-TROLL and oral language skill on ELST, by SLP. The domain Language use scores vary from 15 to 45, whereas the Oral language skill domain scores vary from 2 to 6. The regression line equation is y=2.971 + 0.06x and has an R-squared (R^2) value of 0.145. Thereby it was found that there is a moderate positive correlation between the MTL-SLP and ETOL-SLP.

4.2.2 Correlation of phonological awareness between M-TROLL and ELST.

Table 4.4 shows the Spearman's correlation coefficient between phonological awareness on M-TROLL by teachers, SLP, and on ELST by SLP. Figure 4.3 shows the scatter plot for correlation between phonological awareness on M-TROLL by teachers and on ELST by SLP and Figure 4.4 shows the scatter plot for correlation between phonological awareness on M-TROLL by SLP and on ELST by SLP.

Table 4.4

Spearman's correlation coefficients between phonological awareness on M-TROLL by teachers, SLP and on ELST by SLP

		MTP-T	MTP-SLP	ETP-SLP
MTP-T	Correlation Coefficient	1.000	.958**	.098
	Sig. (2-tailed)	.	.000	.605
	N	30	30	30
MTP-SLP	Correlation Coefficient	.958**	1.000	.195
	Sig. (2-tailed)	.000	.	.302
	N	30	30	30
ETP-SLP	Correlation Coefficient	0.98	.195	1.000
	Sig. (2-tailed)	.605	.302	.
	N	30	30	30

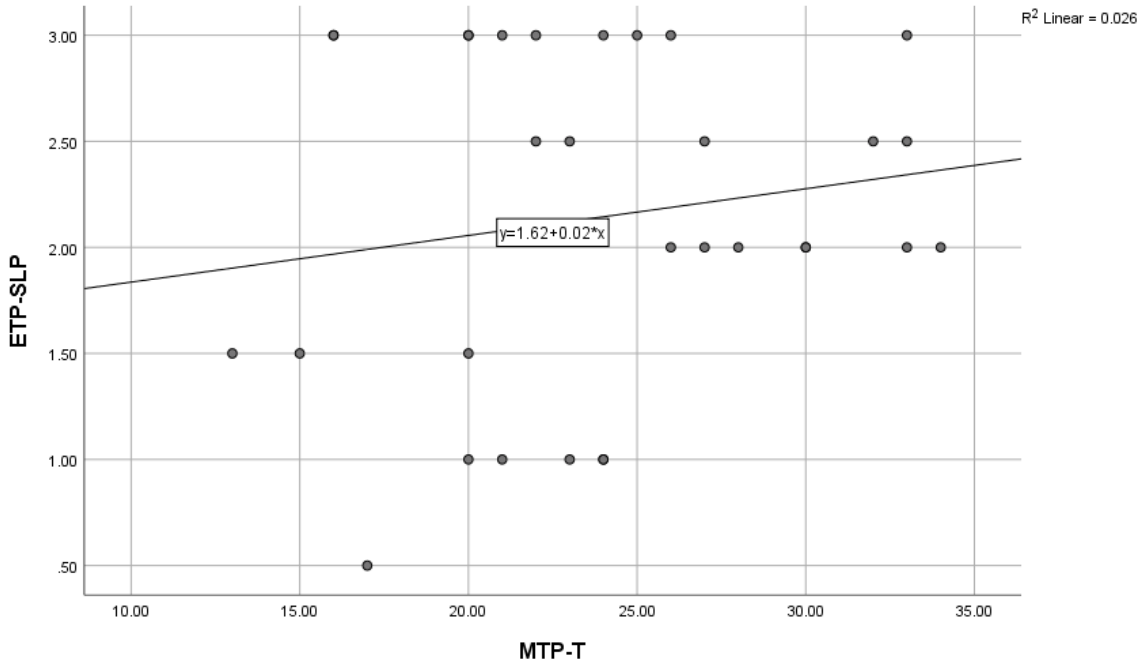
**p<0.05; **p<0.01*

Note: MTP-T= phonological awareness by teachers; MTP-SLP= phonological awareness by SLP; ETP-SLP= phonological awareness on ELST by SLP.

The results from Table 4.4 show that Spearman's correlation coefficient indicated there is no significant correlation [r= 0.098, p= 0.605] between the phonological awareness on M-TROLL by teachers and phonological awareness on ELST by SLP. Also, the analysis of results from Table 4.4 shows the Spearman's correlation coefficient which indicated that there is no significant correlation [r= 0.195,p=0.302] between phonological awareness on M-TROLL and on ELST, by SLP. It shows that children's performance in the Phonological Awareness domain on M-TROLL is not correlated with their performance in the same domain on M-TROLL.

Figure 4.3

Scatter plot for correlation between phonological awareness on M-TROLL by teachers and on ELST by SLP

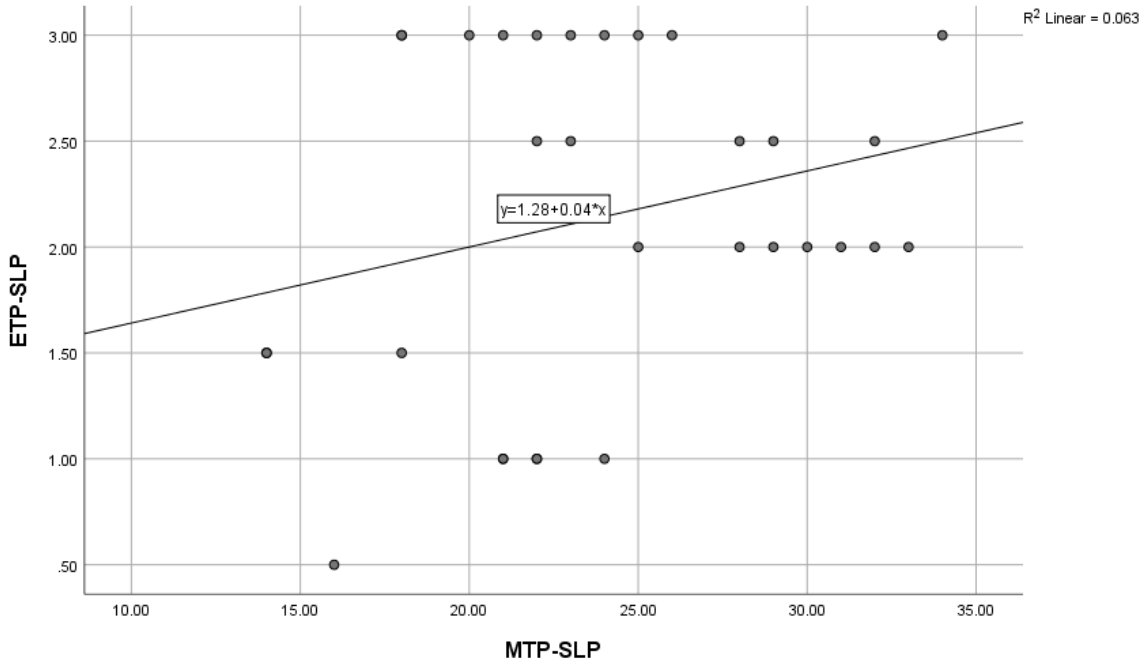


Note: MTP-T=phonological awareness on M-TROLL by teachers; ETP-SLP=phonological awareness on ELST by SLP

From Figure 4.3 it was found that there is a negative correlation between phonological awareness on M-TROLL by teachers and phonological awareness on ELST by SLP. This suggests that if a child scores higher on phonological awareness on M-TROLL, they might score lower on ELST and vice versa.

Figure 4.4

Scatter plot for correlation between phonological awareness on M-TROLL by SLP and on ELST by SLP



Note: MTP-SLP=phonological awareness on M-TROLL by SLP; ETP-SLP=phonological awareness on ELST administered by SLP

From Figure 4.4 it was found that there is a negative correlation between phonological awareness on M-TROLL by SLP and phonological awareness on ELST by SLP. This suggests that if a child scores higher on phonological awareness on M-TROLL, they might score lower on ELST and vice versa.

4.2.3 Correlation between reading (on M-TROLL) and reading skill (on ELST).

Table 4.5 shows the Spearman's correlation coefficient between reading on M-TROLL by teachers, SLP, and reading skills on ELST by SLP. Figure 4.5 shows the scatter plot for correlation between reading on M-TROLL by teachers and reading skills on ELST by SLP and Figure 4.6 shows the scatter plot for correlation between reading on M-TROLL by SLP and reading skills on ELST by SLP.

Table 4.5

Spearman's correlation coefficients between reading on M-TROLL by teachers and reading skill on ELST by SLP

		MTR-T	MTR-SLP	ETR-SLP
MTR-T	Correlation Coefficient	1.000	.975**	.0.582**
	Sig. (2-tailed)	.	.000	.001
	N	30	30	30
MTR-SLP	Correlation Coefficient	.975**	1.000	.566**
	Sig. (2-tailed)	.000	.	.001
	N	30	30	30
ETR-SLP	Correlation Coefficient	.582**	.566*	1.000
	Sig. (2-tailed)	.001	.001	.
	N	30	30	30

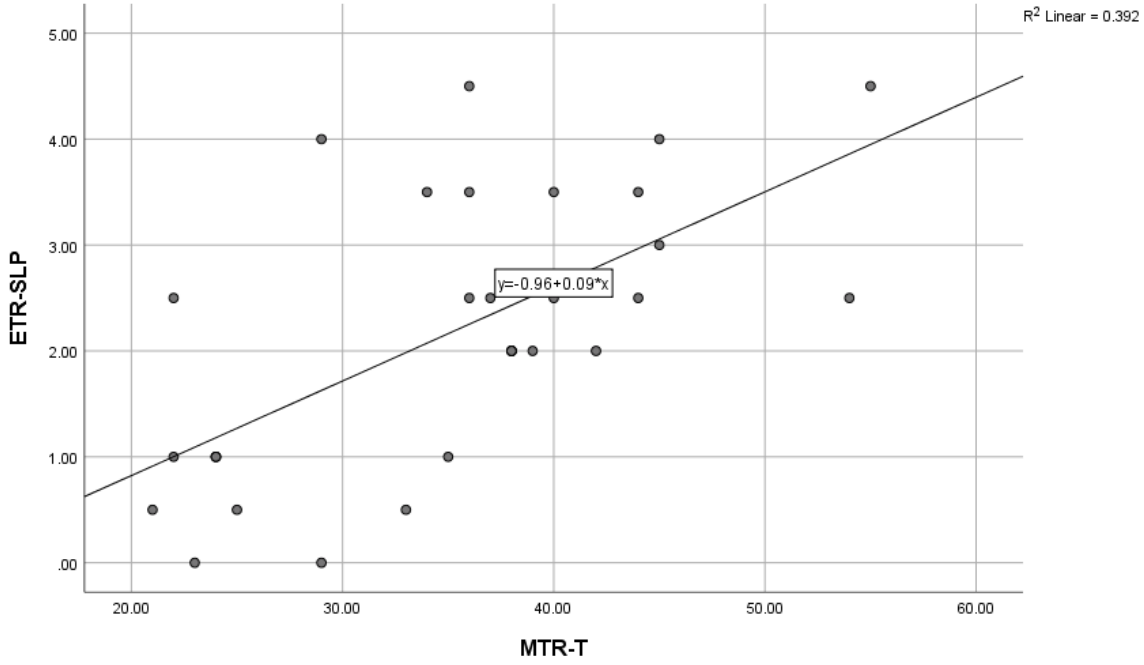
**p<0.05; **p<0.01*

Note: MTR-T= reading on M-TROLL by teachers; MTR-SLP= reading on M-TROLL by SLP; ETR-SLP=reading skill on ELST by SLP.

The results from Table 4.5 show spearman's correlation coefficient, which indicates a significant correlation [r= 0.582, p= 0.001] between reading on M-TROLL by teachers and reading skill on ELST by SLP. Also, the results from Table 4.5 show that Spearman's correlation coefficient indicated there is a significant correlation [r= 0.566, p= 0.001] between the domains reading on M-TROLL by SLP and reading skill on ELST by SLP. Therefore, it has been observed that children who performed highly on the M-TROLL reading domain also performed well on the ELST reading skill domain.

Figure 4.5

Scatter plot for correlation between reading on M-TROLL by teachers and reading skill on ELST by SLP



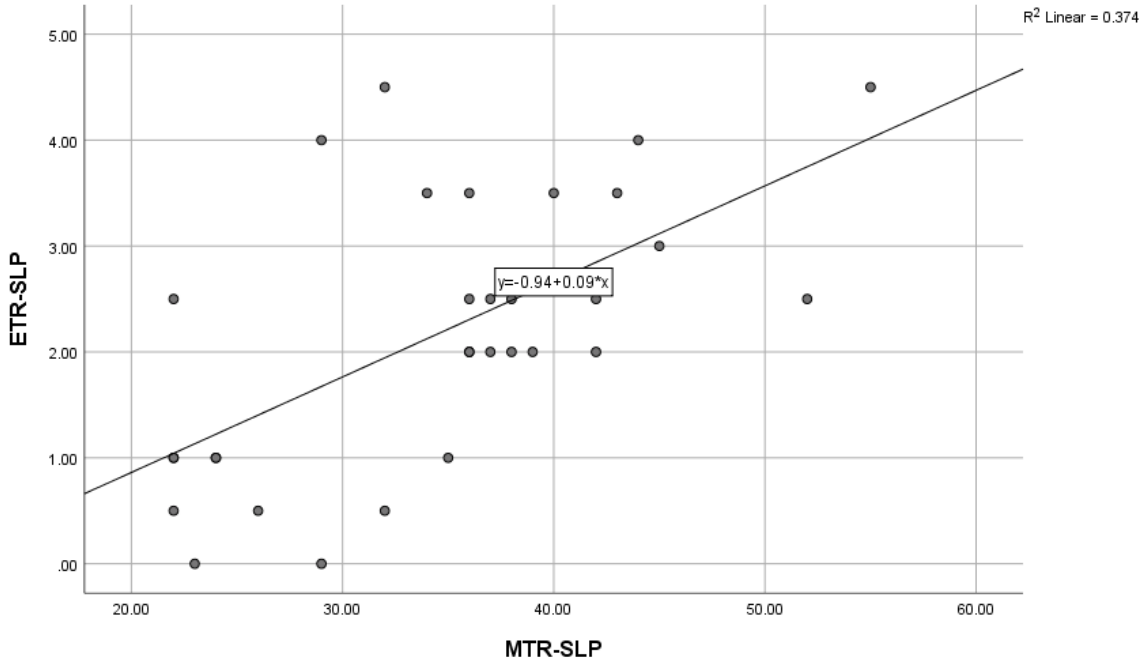
Note: MTR-T= reading on M-TROLL by teachers; ETR-SLP= reading skill on ELST by SLP

On the above Figure 4.5, each point corresponds to a pair of scores of domains reading on M-TROLL and reading skill on ELST. The reading scores

vary from 2 to 60, whereas the reading skill scores vary from 0 to 5. The regression line equation is y= -0.96 + 0.09x and has an R-squared (R^2) value of 0.392. Thereby it was found that there is a moderate positive correlation between the MTR-T and ETR-SLP.

Figure 4.6

Scatter plot for correlation between reading on M-TROLL by SLP and reading skill on ELST by SLP



Note: MTR-SLP=reading on M-TROLL by SLP; ETR-SLP = reading skill on ELST by SLP.

In above Figure 4.6, each point corresponds to a pair of scores of domains reading on M-TROLL and reading skill on ELST. The reading scores vary from 2 to 60, whereas the reading skill scores vary from 0 to 5. The regression line equation is y= -0.94 + 0.09x and has an R-squared (R^2) value of 0.374. Thereby it was found that there is a moderate positive correlation between the MTR-SLP and ETR-SLP.

4.2.4 Correlation between writing (on M-TROLL) and writing skills (on ELST).

Table 4.6 shows the Spearman's correlation coefficient between writing on M-TROLL by teachers, SLP, and writing skills on ELST by SLP. Figure 4.7 shows the scatter plot for correlation between writing on M-TROLL by teachers and writing skills on ELST by SLP and Figure 4.8 shows the scatter plot for correlation between writing on M-TROLL by SLP and writing skills on ELST by SLP.

Table 4.6

Spearman's correlation coefficients between writing on M-TROLL by teachers and writing skill on ELST by SLP

		MTW-T	MTW-SLP	ETW-SLP
MTW-T	Correlation Coefficient	1.000	.899**	.475**
	Sig. (2-tailed)	.	.000	.008
	N	30	30	30
MTW-SLP	Correlation Coefficient	.899**	1.000	.473**
	Sig. (2-tailed)	.000	.	.001
	N	30	30	30
ETW-SLP	Correlation Coefficient	.475**	.473*	1.000
	Sig. (2-tailed)	.008	.008	.
	N	30	30	30

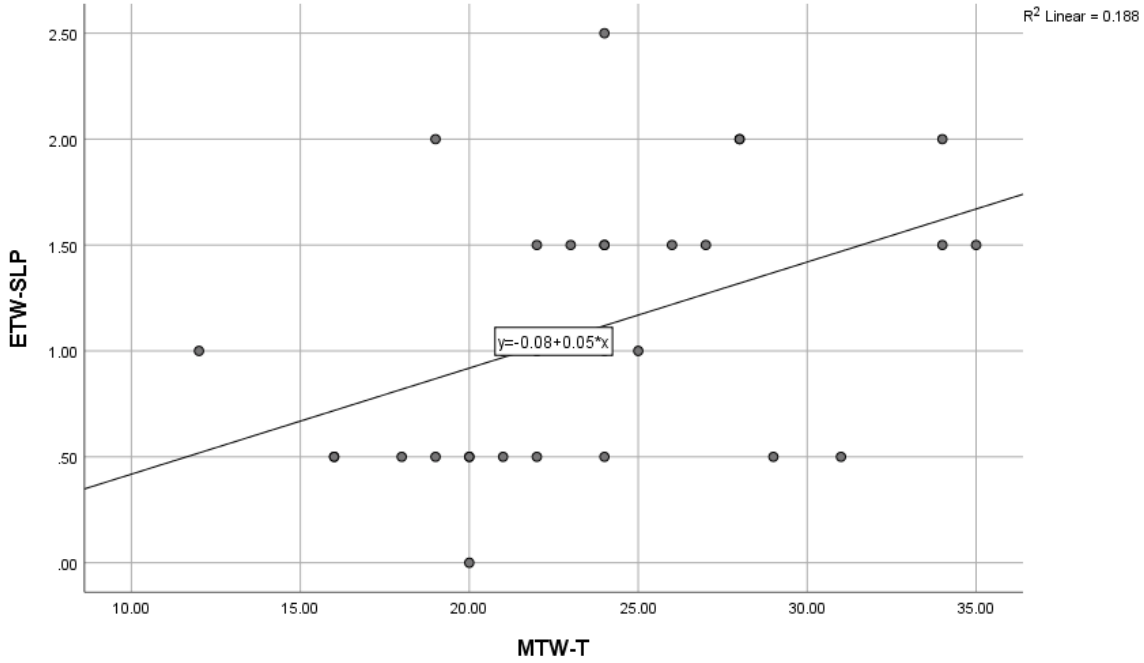
**p<0.05; **p<0.01*

Note: MTW-T= writing on M-TROLL by teachers; MTW-SLP= writing on M-TROLL by SLP; ETW-SLP=Writing skill on ELST administered by SLP

The results from Table 4.6 show spearman's correlation coefficient, which indicates a significant correlation[r=0.475, p=0.008] between writing on M-TROLL by teachers and writing skill on ELST by SLP. Also, the results from Table 4.6 show that Spearman's correlation coefficient indicated there is a significant correlation[r= 0.473, p= 0.008] between the writing on M-TROLL by SLP and writing skill on ELST by SLP. Therefore, it has been observed that children who performed highly on the M-TROLL writing domain also performed well on the ELST writing skill domain.

Figure 4.7

Scatter plot for correlation between writing on M-TROLL by teachers and writing skill on ELST by SLP



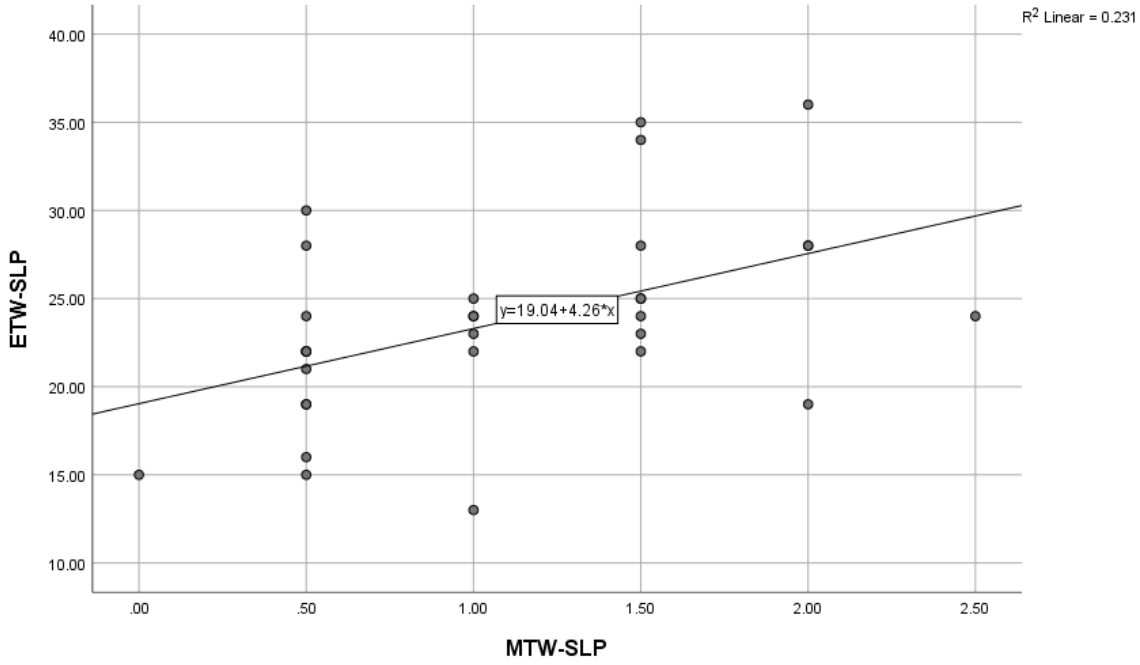
Note: MTW-T= writing on M-TROLL by teachers; ETW-SLP= writing skill on ELST by SLP

In above Figure 4.7, each point corresponds to a pair of scores of writing on M-TROLL and writing skill on ELST. The writing scores vary from 10 to

35, whereas the writing skill scores vary from 0 to 2.50. The regression line equation is y= -0.08 + 0.05x and has an R-squared (R^2) value of 0.188. Thereby it was found that as there is a moderate positive correlation between the MTW-T and ETW-SLP.

Figure 4.8

Scatter plot for correlation between writing on M-TROLL by SLP and writing skill on ELST by SLP



Note: MTW-SLP=writing on M-TROLL by SLP; ETW-SLP=writing skill on ELST by SLP

In above Figure 4.8, each point corresponds to a pair of scores of writing on M-TROLL and writing skill on ELST. The writing scores vary from 10 to 40, whereas the writing skill scores vary from 0 to 2.50. The regression line equation is y= 19.04 + 4.26x and has an R-squared (R^2) value of 0.231. Thereby it was found that as there is a moderate positive correlation between the MTW-SLP and ETW-SLP.

CHAPTER V

DISCUSSION

The findings of the current study are discussed under following sections:

5.1 Performance of teachers and SLP on M-TROLL

5.2 Relationship between the M-TROLL scores with ELST

5.1 Performance of teachers and SLP on M-TROLL

Results under this section are discussed based on the performance of teachers and SLP on the administration of M-TROLL (Thankam & Shanbal, 2011) to the same group of children. Hence, the subsection under this is as following.

5.1.1 Performance of teachers on administration of M-TROLL

As evident in Table 4.1, the mean of the total scores was 110.07 with a SD=23.0 (Mean=110.07, SD= 23.0). Thereby the results indicated that the thirty children (n=30) reflect moderate degree of performance variability; whereas some children performed about average, others have performed above or below average.

The findings of the current study is in support of a previous study conducted by Thankam and Shanbal (2011) where the investigator adapted and modified TROLL into M-TROLL (Thankam & Shanbal, 2011) and it was found out that the mean and SD for overall score on M-TROLL (Thankam & Shanbal, 2011) administered by teachers was 41.06± 22.14 which indicated a relatively

lower performance on all children who were assessed. Hence, it was observed that the results of the current study indicated a greater mean score when compared to the findings from previous study.

This significant difference in the mean and SD, between the current study and study of Thankam and Shanbal (2011) may be attributed to the influence of contextual factors that contributed to such outcomes. The impact of updated Indian education system over the time and the advancement in the knowledge of teachers in identifying learning disabilities could justify the observed difference in mean and SD of overall score on M-TROLL (Thankam & Shanbal, 2011), administered by teachers. While most Indian teachers are aware of learning disability, the awareness of its identification is limited to modest (Kamala & Ramganesh, 2013; Shetty & Rai, 2014; Charan & Kaur, 2017; Moharana, 2019; Hemadharshini et al., 2020). The level of knowledge on learning disability, was found to be dependent on demographic background of the teachers such as age, education, marital status, and most importantly their teaching or training experiences (Shetty & Rai, 2014; Charan & Kaur, 2017).

5.1.2 Performance of SLP on administration of M-TROLL

The mean and SD obtained for total score on MT-SLP was 110.50 ± 23.5 (Table 4.1), in the current study, which indicates that the performance level of children was average and moderate degree of performance variability is present. To date, no documented studies have investigated the administration of M-TROLL (Thankam & Shanbal, 2011) among children by a speech-language

pathologist in India. Consequently, there are no established benchmarks against which the results under this section of present study can be evaluated.

5.1.3 Comparison between the performance of teachers and SLP on the administration of M-TROLL.

Analysis of results from Table 4.1, for the comparison of total scores between teachers and SLP on M-TROLL (Thankam & Shanbal, 2011) in terms of relation between mean and SD, along with the findings from Paired t-test (Table 4.2) yielded the following observations.

The mean score of the overall scores on MT-T were observed to be lesser compared to MT-SLP and paired t-test revealed no significant difference. For language the mean and standard deviation of MTL-T were found to be lesser than MTL-SLP, with a significant difference. The mean of the MP-T, was found to be similar to that of MP-SLP, with no significant difference. The mean score and SD of MTR-T were greater compared to MTR-SLP, with a significant difference. The mean score of MTW-T was observed to be lesser, compared to MTW-SLP, with no significant discussion.

The above-mentioned findings indicated that the mean of total score and mean within language use, phonological awareness and writing are greater when M-TROLL (Thankam & Shanbal, 2011) by SLP, compared to M-TROLL (Thankam & Shanbal, 2011) by teachers in the same population (n=30). However, the mean score in the reading is lesser of M-TROLL (Thankam &

Shanbal, 2011) by SLP, compared to teachers. These variations in mean scores might be attributable to the differences in teachers' and SLPs' knowledge and proficiency about the underlying features, risk factors of learning difficulties. Teachers are in role for the initial identification of students who have learning difficulties. After that, students with learning disabilities are directed to therapists and special educators, who work to determine the specific disorder traits of the student's learning disability. Research indicates that a teacher's recommendation is a highly reliable indicator of a student's eligibility for special education services. Studies have shown that between 73% and 90% of students who meet the eligibility requirements for special education services are referred by their classroom teachers on the basis of their academic performance (Algozzine, Christenson, & Ysseldyke, 1982; Gerber & Semmel, 1984; Gottlieb, Alter, Gotlieb, & Wishner, 1994; Harry & Klinger, 2006; Pugach, 1985; Ysseldyke, 2001).Unfortunately, the majority of teachers are either uneducated about this condition or lack a scientific understanding of it (Peltier et al., 2022).

There are studies which explored the impact of knowledge and attitude of Indian teachers on the identification of learning disabilities. Vrinda (2016) studied the attitude of primary school teachers towards learning disability and the findings indicated that the teachers' attitudes toward including students with learning disabilities in mainstream schools are less favorable. In contrast to this study findings Elizabeth et al., (2019) reported that 63% of primary school teachers had average understanding of learning disability and 51% had a good attitude towards a student with a specific learning condition.

The discrepancy that was observed in the current study, between the mean scores on MT-T and MT-SLP, recommends a collaborative approach incorporating teachers, parents, and SLP on optimizing the early identification of learning disabilities. In an attempt to decide if an evaluation is necessary, school-based speech-language pathologists often utilize screeners, and teacher participation is usually encouraged during this screening process (Fujiki & Brinton, 1984; Marsh, Pane, & Hamilton, 2006; Whitworth, Davies, Stokes, & Blain, 1993). Thereby, it is encouraged the participation of teachers in the SLP screening process to increase the accuracy of screening (Fujiki & Brinton, 1984; Marsh et al., 2006; Patterson & Wright, 1990; Whitworth et al., 1993). However, the authors of the original teacher designed questionnaire TROLL (Dickinson et al.,2001, 2003) recommend that teachers collaborate with parents to complete the TROLL (Dickinson et al.,2001, 2003).

As per the findings in Table 4.2, there was no significance difference between the total score of MT-T and MT-SLP, as well as in MP-T and MP-SLP and MTW-T and MTW-SLP. However, significant differences were observed in the MTL-T and MTL-SLP and MTR-T and MTR-SLP. The significant difference observed between MTL-T and MTL-SLP could be attributed to several factors: In the framework of the National Education Policy (NEP; 2020), which mandates India's bilingual education system, the language of instruction (English) may differ from students' native languages. The mandated use of English as the medium of instruction might create a disconnection between the native language of teachers and students. SLPs, with their expertise in language development and language disorders, possess a expertise skill to identify subtle

language difficulties of children, performed on the M-TROLL (Thankam & Shanbal, 2011), whereas teachers, who were primarily focuses on curriculum delivery might miss these nuances. The gap in proficiency skills may become more pronounced when teachers' first languages are distinct from those of their students. Interestingly, during the process of data collection for the present study, the pattern of native language of primary teachers (Hindi) from 4 out of 6 schools, was observed to be deviated from that of student's native language (Kannada). This linguistic disparity could explain the observed lower scores on the teacher-administered M-TROLL (Thankam & Shanbal, 2011) compared to the SLP. Knowing a child's communication abilities in both their native language and the language of instruction allows for more accurate scoring of several questions (questions such as the performance of child in starting conversation, sharing personal experience and asking questions of interested topics, etc.) within the M-TROLL (Thankam & Shanbal, 2011) language use domain. To enhance early identification within the NEP framework, it is recommended that teachers receive training in recognizing language difficulties in students with diverse linguistic backgrounds, when it comes to meeting the needs of children with learning disabilities, the NEP advocates for giving them the necessary attention by using technology and suitable diagnostic techniques.

The significant difference observed between MTR-T and MTR-SLP could be justified with the findings put forth by certain studies: Although teachers utilize reading assignments and class tests to evaluate students' reading abilities and progress, they tend to favor summative assessments over formative assessments for assessing reading comprehension. Summative assessments are

conducted periodically to gauge overall learning outcomes, aligning assessment directly with the curriculum. In English language teaching, reading assessment encompasses evaluating students' general reading proficiency, comprehension, informational and argumentative reading skills, reading strategies, and recreational reading (Richek et al., 2009). Regarding this, formative assessments are recognized as more beneficial during the learning process compared to summative assessments. Perera-Diltz and Moe (2014) have recently argued that formative assessments enhance teachers' instructional methods and enable them to monitor students' progress towards academic standards. Therefore, it is recommended that teachers integrate formative assessments into classroom practices rather than relying solely on summative tests. This approach encourages students to actively engage in reading through dialogues, role-plays, storytelling, and summaries, fostering their individual development, interests, and learning needs. Upon reviewing the aforementioned study findings alongside the types of questions found in the reading section of M-TROLL (Thankam & Shanbal, 2011), it becomes apparent that these questions resemble characteristics of formative assessment. In the context of Indian education, teachers generally lean towards summative rather than formative assessment. During the observation of teachers' performance in the current study, it was observed that most teachers focused solely on assessing children's reading abilities, without taking into account their overall interactions with peers in the classroom. And some research findings shows that teachers were more accurate when asked to estimate students' performance compared to their peers rather than estimating actual reading scores in words read correctly per minute (Feinberg & Shapiro, 2003). Some teachers express concern

cogently when they speak of their experiences with word callers (i.e., students who read fluently, yet do not comprehend what they read). Teachers who have word callers in their classrooms argue that RCBM may overestimate these students' reading skills and not be sensitive their reading difficulties, in effect mistaking the word callers for competent readers (Hamilton, 2003). Therefore, their evaluation of child's performance in reading, which are meant to assess through an ongoing reading progress, may lack validity. This discrepancy could affect the accurate scoring of reading skills of children using M-TROLL (Thankam & Shanbal, 2011). Although India lacks standardized tests for formative assessment of reading skills, M-TROLL (Thankam & Shanbal, 2011) can be considered to use efficiently for this specific intent.

This subsection met the first objective of the study, which was to evaluate and compare M-TROLL (Thankam & Shanbal, 2011) assessments scores among various educators and professionals (Teachers and SLP). From the findings of above section, it is indicative that the null hypothesis proposed $H_0$1: "*There is no significant difference between M-TROLL (Thankam &Shanbal, 2011) assessments given by teachers and SLPs on administering M-TROLL (Thankam & Shanbal, 2011)"* is accepted.

5.1 Relationship between the M-TROLL scores with ELST

5.2.1 Correlation between language use (on M-TROLL) and oral language skill (on ELST)

In the present study, as shown in Table 4.3, the results indicated a significant correlation between the language use on M-TROLL (Thankam &

Shanbal, 2011) by teachers with oral language skills on ELST (Goswami & Shanbal, 2009)by SLP. Also, the analysis of results from Table 4.3 shows that the there is a significant between the language use on M-TROLL (Thankam & Shanbal, 2011) by SLP and oral language skills on ELST (Goswami & Shanbal, 2009) by SLP. Therefore, higher scores in the language use of M-TROLL (Thankam & Shanbal, 2011), correspond to higher scores in Oral language skills on the ELST (Goswami & Shanbal, 2009) and vice versa. The figure 4.1 and figure 4.2 shows a moderate positive correlation between MTL-T with ETOL-SLP and MTL-SLP with ETOL-SLP, respectively. This suggests that as the score on MTL-T increases the score on ETOL-SLP increases and vice versa. Similar relation is also observed between MTL-SLP and ETOL-SLP. Therefore, it has been identified that children who performed well on the language use on M-TROLL (Thankam & Shanbal, 2011) also performed similarly on the oral language skill on ELST (Goswami & Shanbal, 2009).

The above-mentioned correlation between M-TROLL (Thankam & Shanbal, 2011) and ELST (Goswami & Shanbal, 2009), can be explained by the analysing the patterning of questions under language use of M-TROLL (Thankam & Shanbal, 2011) and oral language skills of ELST (Goswami & Shanbal, 2009). Questions in M-TROLL (Thankam & Shanbal, 2011) under the language domain cover a broad spectrum of communication behaviors, encompassing peer interactions, sharing experiences, pretend play scenarios, and curiosity-driven inquiries. This broader scope reflects a holistic view of children's communicative abilities in diverse social contexts. In contrast, ELST’s (Goswami & Shanbal, 2009) oral language skill domain focuses more

narrowly on specific aspects of language development. It segregates questions to assess comprehension skills, such as understanding simple commands and questions, and expression skills, particularly through activities like picture description. This targeted approach aims to assess children's abilities in structured language tasks. Since, both M-TROLL (Thankam & Shanbal, 2011) and ELST (Goswami & Shanbal, 2009) language domain aim to assess children's language skills, they differ in scope and approach. This variation can contribute to the only moderate positive correlation between M-TROLL (Thankam & Shanbal, 2011) and ELST (Goswami & Shanbal, 2009), as per mentioned in Table 4.3.

There are few research documenting how TROLL (Dickinson et al., 2001, 2003) correlates with other standardized tests in assessing children's language skills. However, as of now, there are no studies reported on how M-TROLL (Thankam & Shanbal, 2011) relates to other standardized tests in evaluating language skills. Rodriguez and Guiberson (2011) found out a significant relationship between preschool teacher's ratings of children's language and literacy skills, based upon the TROLL(Dickinson et al.,2001, 2003) and children's performance on a standardized measure of expressive and receptive language skills on Preschool Language Scale -4 (PLS-4) (Zimmerman, 2002). The study found out that language subscale of the TROLL (Dickinson et al., 2001, 2003) significantly correlated with the expressive (r= .16, p=0.02) and receptive (r= .17, p= 0.001) subscales of the PLS-4 (Zimmerman, 2002) across all the language groups (English-speaking, Spanish-speaking and bilinguals). This correlation can be justified based on the

consistency in assessment, where both TROLL (Dickinson et al., 2001, 2003) and PLS-4(Zimmerman, 2002) focus on language and literacy skills, albeit using different assessment methods. The alignment in the focus of assessment contributes to the correlation between the two measures. The TROLL (Dickinson et al., 2001, 2003) and PLS-4 (Zimmerman, 2002) may capture different aspects of language development, with the TROLL (Dickinson et al., 2001, 2003) reflecting more qualitative observations by teachers and the PLS-4(Zimmerman, 2002) providing a standardized measure. The correlation indicates those teachers' qualitative assessments using TROLL (Dickinson et al., 2001, 2003) align with standardized measures of language skills.

5.2.2 Correlation between phonological awareness (on M-TROLL and ELST)

In the present study, as shown in Table 4.4, the results indicated no significant correlation between phonological awareness on M-TROLL (Thankam & Shanbal, 2011) and on ELST (Goswami & Shanbal, 2009), by teachers and SLP. The figure 4.3 and figure 4.4 shows no correlation between MTP-T with ETP-SLP and MTP-SLP with ETP-SLP, respectively. Therefore, the scores obtained from M-TROLL (Thankam & Shanbal, 2011) for phonological awareness do not correspond closely with those obtained from ELST (Goswami & Shanbal, 2009), indicating no relationship between phonological awareness between M-TROLL (Thankam & Shanbal, 2011) and ELST (Goswami & Shanbal, 2009).

The discrepancy in this correlation, can be reasoned with the difference present in the patterning of questions under both M-TROLL (Thankam & Shanbal, 2011) and ELST (Goswami & Shanbal, 2009). The questions appear under phonological awareness of M-TROLL (Thankam & Shanbal, 2011) include tasks, that focus on broader aspects of phonological awareness such as the phoneme-grapheme correspondence, recognizing rhyming words and syllable counting. Whereas, the questions under ELST (Goswami & Shanbal, 2009), includes that evaluates particular aspects of phonological awareness such as phoneme counting, phoneme blending, phoneme identification, phoneme deletion, phoneme substitution and phoneme oddity. These differences may reflect the variations in the scores obtained from same children, using M-TROLL (Thankam&Shanbal, 2011) and ELST (Goswami &Shanbal, 2009).

Another reason which can contribute to discrepancy in the correlation could be the teacher's limited knowledge and awareness about phonological skills. Phonological awareness is a skill, which starts to develop during the preschool period, can be developed and taught, cannot develop on its own, is a determinant of reading-writing problems and has an important role effect in reading-writing achievement in the future (Catts, Gillispie, Leonard, Kail, & Miller, 2002; Chard & Dickson, 1999; Ege, 2006; Olofsson &Niedersoe, 1999; Phillips, Menchetti, & Lonigan, 2008; Pullen & Justice, 2003; Roskos, Christie, &Richgelds, 2003; Torgesen et al., 1992; Rubba, 2004; Torgesen & Wagner, 1998). Stahl & Murray (1994) mentioned that there was a relationship between the phonological awareness and reading, writing development in the studies carried out. The hypothesis that the children who are successful in phonological awareness related tasks are more advantageous in learning how to read is

generally accepted (Nation &Snowling, 2004).Sana (2005) found out that in general, teachers demonstrated low levels of knowledge and skills in phonological skills regardless of their training and whether they teach regular or special needs students. There are supporting studies done by few other investigators. Bos & Chard (2001) stated that even though teachers might have received some training in phonological awareness, many still showed significant gaps in their knowledge and instructional skills. The study done by Brady et al (2009) revealed that many teachers lacked a deep understanding of phonological awareness concepts and their importance in reading instruction. The study highlighted that "teachers, irrespective of their training, often demonstrated limited ability to apply phonological awareness in classroom instruction," indicating a need for more comprehensive and practical training programs. In addition to this Hindson et al. (2005) concluded that even after participating in professional development programs, a considerable number of teachers did not demonstrate adequate proficiency in phonological awareness instruction.

In relation to these research findings, a notable pattern observed in the educational approach of the schools from which the data for this study was collected. The 2 out of 6 schools provides phonological training to students, as part of Montessori training program, which leads to better scoring on MTP-T, MT-SLP and ETP-SLP. The teachers from other 4 schools, were observed to be unaware about the phonological skills, thereby contributed to poorer scoring. These observations of the present study suggest the need for providing intensive and ongoing training on phonological skills to teachers, to bridge the gap between theoretical knowledge and practical application.

5.2.3 Correlation between reading (on M-TROLL) and reading skill (on ELST)

In the present study, as shown in Table 4.5, the results indicated a significant correlation between the reading on M-TROLL (Thankam&Shanbal, 2011) by teachers and SLP, with reading skill on ELST(Goswami &Shanbal, 2009)by SLP. Therefore, higher scores in the reading of M-TROLL (Thankam&Shanbal, 2011), correspond to higher scores in reading skills on the ELST and vice versa. The figure 4.5 and figure 4.6 shows a moderate positive correlation between MTR-T with ETR-SLP and MTR-SLP with ETR-SLP, respectively. Therefore, it has been identified that children who performed well on the reading on M-TROLL (Thankam&Shanbal, 2011) also performed similarly on the reading skill on ELST (Goswami &Shanbal, 2009).

The above-mentioned relationship between MTR and ETR, could be justified by the similarities in the questions under both M-TROLL(Thankam&Shanbal, 2011) and ELST (Goswami &Shanbal, 2009).Although, the questions under reading on M-TROLL(Thankam&Shanbal, 2011) carries out a formative assessment and the questions under reading skill on ELST (Goswami &Shanbal, 2009), evaluates grapheme-phoneme correspondence, both assess the foundational elements for ability to read and includes similar tasks such as sight-word recognition, phoneme identification, orthographic mapping. This can attribute to similar performance of child on both M-TROLL (Thankam&Shanbal, 2011) and ELST (Goswami &Shanbal, 2009).

There are studies stating the correlation of reading domain on TROLL (Dickinson et al., 2001, 2003) with other standardized tests. Dickinson et al (2003) reported that TROLL (Dickinson et al.,2001, 2003) scores demonstrate a moderate association between the children's scores on three measures of language and literacy skills (language, reading and writing) with Emergent Literacy Profile (ELP; Dickinson & Chaney, 1997) assesses children's ability to read environmental print and with early phonemic awareness Profile. Another study done by Gregory in 2015, found out that TROLL (Dickinson et al.,2001, 2003) showed high correlations with the DIBELS (Good, Gruba, & Kaminski, 2009) indicating its potential to identify learning disabilities in children. There are some common skills that is evaluated under reading domain of both TROLL (Dickinson et al., 2001, 2003) and ELP, such as phonological awareness, oral language skills. And the skill of story-retelling is evaluated under both TROLL (Dickinson et al., 2001, 2003) and DIBELS (Good, Gruba, & Kaminski, 2009) which shows a similarity in the skills, being assessed.

5.2.4 Correlation between writing (on M-TROLL) and writing skill (on ELST)

In the present study, as shown in Table 4.6, the results indicated a significant correlation between the writing on M-TROLL (Thankam&Shanbal, 2011) by teachers and SLP, with writing skill on ELST (Goswami &Shanbal, 2009)by SLP. Therefore, higher scores in the writing of M-TROLL (Thankam&Shanbal, 2011), correspond to higher scores in writing skills on the ELST (Goswami &Shanbal, 2009) and vice versa. The figure 4.7 and figure 4.8

shows a moderate positive correlation between MTW-T with ETW-SLP and MTW-SLP with ETW-SLP, respectively. Therefore, it has been identified that children who performed well on the writing on M-TROLL (Thankam&Shanbal, 2011) also performed similarly on the writing kill on ELST (Goswami &Shanbal, 2009).

The finding from Table 4.6, shows a moderate positive correlation between MTW-T & ETW-SLP [r= 0.475, n= 30, p= 0.008] and between MTW-SLP & ETW-SLP [r= 0.473, n= 30, p= 0.008], which appears to be the lowest correlation when compared to other domains. This weak correlation between MTW and ETW, can be explained by the difference in the tasks and skills evaluated under writing ofM-TROLL (Thankam&Shanbal, 2011) and ELST (Goswami &Shanbal, 2009). The writing on M-TROLL (Thankam&Shanbal, 2011) includes skills such as pretend writing, writing of own names, other's names, real words, signs, labels, stories, songs and poems. Whereas, the writing on ELST (Goswami &Shanbal, 2009) includes only two tasks, dictation and copying. In essence, MTW offers a more comprehensive picture of writing development, while ETW isolates specific skills, such as grapheme-phoneme correspondence, mechanism of handwriting. This difference in scope can lead to a weak correlation between the two measures.

Unfortunately, finding studies specifically on the correlation between the writing domain of TROLL (Dickinson et al.,2001, 2003) (MTW) and other standardized tests might be challenging. While TROLL (Dickinson et al.,2001, 2003) is a recognized assessment, research specifically focusing on its writing

domain seems less prevalent compared to studies on the overall TROLL (Dickinson et al.,2001, 2003) assessment. Dicksinson et al (2003) reported a moderate correlation between writing on TROLL(Dickinson et al.,2001, 2003) and PPVT (Dunn &Dunn, 1997), suggestive of a connection between vocabulary knowledge (measured by PPVT) and writing ability (measured by TROLL-Writing), where the students with stronger vocabulary skills tend to score higher on writing assessments.

Therefore, this subsection met the second objective of the study, which was to study the relationship between the M-TROLL (Thankam&Shanbal, 2011) assessment score with the ELST (Goswami &Shanbal, 2009). From the findings of above section, it is indicative that the null hypothesis proposed$H_0$2: "*There is no significant correlation between M-TROLL (Thankam&Shanbal, 2011) assessment scores and ELST (Goswami &Shanbal, 2009) is rejected.*

CHAPTER VI

SUMMARY AND CONCLUSION

The present study aimed to validate M-TROLL to identify children at risk for learning disability. The objectives of the study involve: 1) To evaluate and compare M-TROLL (Thankam& Shanbal,2011) assessments scores among various educators and professionals (Speech-Language Pathologists and Teachers); 2) To study the relationship between the M-TROLL (Thankam&Shanbal, 2011) assessment score withthe ELST (Goswami and Shanbal, 2009).

The participants of the study included a total of 30 children within an age range of 5-7 years, who were the students of first standard and 30 teachers were taken up for the present study. They were selected from diverse schools, within the city of Mysuru. The teachers who served as the primary instructor of the children and had at least half a year of direct teaching experience with them, were also included in the study. The study was carried out in four phases; In phase 1, the content validation of M-TROLL (Thankam &Shanbal, 2011) by two SLPs and one special-educator was carried out, where the validators have to rate each questions using a Likert rating scale ranging from 1 (not at all appropriate) to 4 (most appropriate). In phase 2, the questionnaire was distributed to the teachers and instructed them to evaluate on each child, individually. Followed by teacher's administration, SLP evaluated each child using M-TROLL, within the school environment itself. In phase 3, mean and SD of total score and scores under each domain on M-TROLL (Thankam

&Shanbal, 2011) were calculated. In phase 4, concurrent validity between M-TROLL (Thankam &Shanbal, 2011) and ELST (Goswami &Shanbal, 2009) was conducted. The recorded responses of questionnaires were subjected to descriptive and correlational statistics.

The result of descriptive statistics analysed the mean and SD of scores on M-TROLL (Thankam &Shanbal 2011) by teachers and SLP and Paired t-test revealed that there is no statistically significant difference between the scoring of teachers and SLP on M-TROLL (Thankam &Shanbal, 2011). The correlation analysis revealed no statistically significant difference between language, reading and writing domains on M-TROLL (Thankam &Shanbal, 2011) and ELST (Goswami &Shanbal, 2009), but revealed a statistically significant difference on phonological awareness domain.

The current study's findings for the first objective confirmed that teachers can use M-TROLL (Thankam &Shanbal, 2011) to evaluate a child's language and literacy skills, yielding scores similar to those assessed by an SLP.The findings of the current study for the second objective, which examined the correlation between the domains of M-TROLL (Thankam &Shanbal, 2011) and ELST (Goswami &Shanbal, 2009), showed a significant correlation across all domains except phonological awareness.

Implications of the current study

The findings of this study highlight how important it is to incorporate learning disability awareness into training programs for educators to alleviate the existing gaps in knowledge and assessment of learning disability. The findings of this study put forth the significance for additional research into the value of teacher observations in identifying various learning difficulties in Indian educational context. The investigator of the present study additionally provided educators with information about their potential contribution to the early detection of learning disabilities within the classroom.

The current study emphasizes the need for intense training to teachers in order to cultivate their proficiency in identifying subtle language and literacy issues, manifested by their students. Teachers can lay the foundation for collaboration with specialists, such as speech-language pathologists or special education professionals. By discussing assessment results, educators and parents can foster a cooperative relationship between these groups. This relationship is crucial for implementing consistent strategies and support at home and in the classroom. Teacher assessments provide invaluable information for advocating appropriate support services and educational resources within the school system, enabling schools to meet the diverse learning needs of all children.

Limitations and Future Directions

Despite the notable findings in the study, certain limitations of current study were identified. The necessity to replicate the data with a larger sample size, which could contribute to the generalizability of the findings. Also, the study findings is purely based on teacher's response, whereas parent's reports which is vital to understand language and literacy issues of a child, is not taken into consideration. The future research should consider the cultural variations which reflects in the response of both teachers and students and should explore the practical implementation of collaboration between SLP and teachers on identifying a child at risk for learning disability.

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APPENDIX-A
MODIFIED TEACHER RATING OF ORAL LANGUAGE AND LITERACY

(M-TROLL)

LANGUAGE USE

1. How would you describe this child's willingness to **start a conversation** with adults and peers and continue trying to communicate when he/she is not understood on the first attempt? Select the statement that best describes how hard the child works to be understood by others.

Child almost never begins a conversation with peers or the teacher and never keeps trying if unsuccessful at first.	Child sometimes begins conversation with either peers or the teacher. If initial efforts fail, he/she often gives up quickly.	Child begins conversations with both peers and teachers on occasions. If initial efforts fail, he/she will sometimes keep trying.	Child begins conversations with both peers and teachers. If initial efforts fail, he/she will work hard to be understood.
English: 1 Kannada: 1	2 2	3 3	4 4

2. How well does the child communicate personal experiences in a clear and logical way? (When he/she is attempting to tell an adult about events that happened at home or some other place where you were not present.)

Child is very tentative, only offers a few words,	Child offers some information, but information needed to	Child offers information and sometimes includes	Child freely offers information and

requires you to ask questions. Has difficulty responding to questions you ask.	really understand the event is missing (e.g., where or when it happened, who was present, the sequence of what happened).	the necessary information to really understand the event.	tells experiences in a way that is nearly always complete, well sequenced, and comprehensible.
English: 1 Kannada: 1	2 2	3 3	4 4

3. How often does the child use a varied vocabulary or try out new words (e.g., heard in stories or from teacher).

NEVER	RARELY	SOMETIMES	OFTEN
English: 1 Kannada: 1	2 2	3 3	4 4

4. When the child speaks to adults other than you or the teaching assistant, is **he/she understandable?**

NEVER	RARELY	SOMETIMES	OFTEN
English: 1 Kannada: 1	2 2	3 3	4 4

5. How would you describe this child's pattern of asking questions about topics that interest him/her (e.g., why things happen, why people act the way they do)?

To your knowledge, the child has never	On a few occasions the child has asked adults	On several occasions the child	Child often asks adults questions

asked an adult a question reflecting curiosity about why things happen or why people do things.	some questions. The discussion that resulted was brief and limited in depth.	has asked interesting questions. On occasion these have lead to an interesting conversation.	reflecting curiosity. These often lead to interesting, extended conversations.
English: 1 Kannada: 1	2 2	3 3	4 4

6. How would you describe this child's use of talk while **pretending** in the house area, when playing with blocks, etc.? Consider the child's use of talk with peers to start pretending and to carry it out. Assign the score that best applies.

Child rarely or never engages in pretend play or else never talks while pretending.	On occasion the child engages in pretending that includes some talk. Talk is brief, may only be used when starting the play, and is of limited importance to the on-going play activity.	Child engages in pretending often and conversations are sometimes important to the play. On occasion child engages in some back-and-forth pretend dialogue with another child.	Child often talks in elaborate ways while pretending conversations that are carried out "in role" are common and is an important part of the play. Child sometimes steps out of pretend play to give directions to another.
English: 1 Kannada: 1	2 2	3 3	4 4

7. How often does the child **express curiosity** about how and why things happen?

NEVER	RARELY	SOMETIMES	OFTEN
English: 1	2	3	4
Kannada: 1	2	3	4

Language subtotal:

PHONOLOGICAL AWARENESS

8. Can the child recognize letters such as A,C, E etc ?

None of the letters of the alphabet	Some of them (up to 10)	Most of them (up to 20)	All of them
English: 1	2	3	4
Kannada: 1	2	3	4

9. Does the child have a beginning understanding of the relationship between sounds and letters (e.g., the letter B makes a "buh" sound)?

No	One or two	A few (up to 4 or 5)	Several (6 or more)
English: 1	2	3	4
Kannada: 1	2	3	4

10. How would you describe the child's ability to **recognize and produce rhymes**? E.g. does he know that the words **cat** and **rat** rhyme or **cat** and **cup** do not rhyme and can he say the words which rhyme with **cat**. (**cat, rat, mat**)

Child cannot ever say if two words rhyme and cannot produce a rhyme when given examples	Child occasionally produces or identifies rhymes when given help.	Child spontaneously produces rhymes and can sometimes tell when word pairs rhyme.	Child spontaneously rhymes words of more than one syllable and always identifies whether words rhyme.
English: 1	2	3	4
Kannada: 1	2	3	4

11. Can the child appreciate the number of syllables in a word? E.g., man-go- 2 syllables

Cat- 1 syllable

NEVER	RARELY	SOMETIMES	OFTEN
English: 1	2	3	4
Kannada: 1	2	3	4

12. Can the child appreciate the number of words spoken in a sentence? When asked to clap one time for each word in a sentence, can he do that? E.g., My-house-is-big (4 claps)

NEVER	RARELY	SOMETIMES	OFTEN
English: 1	2	3	4
Kannada: 1	2	3	4

Phonological awareness subtotal:

READING

13. How often does the child like to hear books read in the full group?

NEVER	RARELY	SOMETIMES	OFTEN
English: 1	2	3	4
Kannada: 1	2	3	4

14. How often does the child attend to stories read in full or small groups and react in a way that indicates comprehension?

NEVER	RARELY	SOMETIMES	OFTEN
English: 1	2	3	4
Kannada: 1	2	3	4

15. How often does the child look at or read books alone or with friends?

NEVER	RARELY	SOMETIMES	OFTEN
English: 1	2	3	4
Kannada: 1	2	3	4

16. Does the child recognize his/her own first name in print?

NO	YES
English: 1	English: 2
Kannada:1	Kannada:2

17. Does the child recognize other's names?

No	One or two	A few (up to 4 or 5)	Several (6 or more)
English: 1	2	3	4
Kannada: 1	2	3	4

18. Can the child read any other words?

No	One or two	A few (up to 4 or 5)	Several (6 or more)
English: 1	2	3	4
Kannada: 1	2	3	4

19. Can the child sound out words that he/ she have not read before?

No	Once or twice	One syllable words often	Many words
English: 1	2	3	4
Kannada: 1	2	3	4

20. Is the child able to read story books on his/her own?

Does not pretend to read	pretends to read	pretends to read and reads some words	Read the written words
English: 1 Kannada: 1	2 2	3 3	4 4

21. How often does the child remember the story line or characters in books that he/she heard before either at home or in class?

NEVER	RARELY	SOMETIMES	OFTEN
English: 1 Kannada: 1	2 2	3 3	4 4

Reading subtotal:

WRITING

22. What does the child's writing look like?

Only draws or scribbles	Some letter-like marks	Many conventional letters	Conventional letters and words
English: 1 Kannada: 1	2 2	3 3	4 4

23. How often does the child like to write or pretend to write?

NEVER	RARELY	SOMETIMES	OFTEN
English: 1	2	3	4
Kannada: 1	2	3	4

24. Can the child write his /her first name, even if some of the letters are backwards?

NEVER	RARELY	SOMETIMES	OFTEN
English: 1	2	3	4
Kannada: 1	2	3	4

25. Does the child write other names or real words?

No	One or two	A few (up to 4 or 5)	Several (6 or more)
English: 1	2	3	4
Kannada: 1	2	3	4

26. How often does the child write signs or labels?

NEVER	RARELY	SOMETIMES	OFTEN
English: 1	2	3	4
Kannada: 1	2	3	4

27. Does the child write stories, songs, poems or lists?

NEVER	RARELY	SOMETIMES	OFTEN
English: 1	2	3	4
Kannada: 1	2	3	4

Writing subtotal:

TOTAL TROLL SCORE: