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Grade 4 learners with reading and writing difficulties in Mauritius: Perspectives of teachers and parents, and characteristics of learners

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"Never stop fighting until you arrive at your destined place- that is, the unique you. Have an aim in life, continuously acquire knowledge, work hard and have a perseverance to realise the greatness of life"

- A.P.J. Abdul Kalam

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Every child struggling to learn the basic abilities to read and write in Mauritius.

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PLAGIARISM DECLARATION

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DECLARATION

Full name: Sattiavany Veerabudren (Student)

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Title of thesis: **Grade 4 learners with reading and writing difficulties in Mauritius: Perspectives of teachers and parents, and characteristics of learners**

I declare that this thesis is my own original work. Where secondary material is used it has been carefully acknowledged and referenced in accordance with university requirements.

I understand what plagiarism is and am aware of university policy and implications in this regard.

11 November 2021

Signature Date

ETHICS STATEMENT

The author, whose name appears on the title page of this thesis, has obtained the applicable research ethics approval for the research described in this work.

The author declares that she has observed the ethical standards required in terms of the University of Pretoria's Code of Ethics for Researchers and the Policy guidelines for responsible research.

11 November 2021

Signature

Date

ABSTRACT

Problem statement and rationale.

Reading and writing difficulties (RWD) are persistent difficulties in academic domains such as reading, spelling, and written expression. Learners with RWD are typically accommodated in mainstream schools in Mauritius without formal support or diagnosis. Speech-language therapists (SLTs) play a key role in building literacy foundations and collaborate to assist in intervention. An inclusive education policy has been adopted but not yet implemented in Mauritius. Little to no information is available on how teachers and parents support learners with RWD. The characteristics of such learners are also unknown. Research may reveal needs of teachers and parents. Findings may provide evidence-based information that could be used to implement inclusive education strategies in schools.

Aim.

To investigate the characteristics of Grade 4 learners with RWD in mainstream government schools in Mauritius, and the perspectives of their parents and teachers.

Methods.

Three studies were conducted. Study 1 and 2 employed self-completed questionnaires to investigate teachers' and parental perspectives on learners with RWD. A hundred teachers from randomly selected schools were recruited for Study 1. Grade 4 learners with RWD were identified by teachers with the Screening Tool for Learning Disorder (STLD). Sixty-seven parents participated in Study 2.

The children of the participants of Study 2 were investigated in Study 3. Listening, speaking, reading, and writing skills were studied using the Clinical Evaluation of Language Fundamentals, 5th edition Observation Rating Scale (CELF-5 ORS), the Gray Oral Reading Test, 4th edition, and the Schonell Spelling Test. The research group (RG) comprised 67 learners with mean age 9 years. A control group (CG) of 49 learners without RWD with mean age 9.3 years was recruited for comparison with the standardised tests. Hearing loss and visual impairment were excluded.

Results.

According to Study 1, primary school teachers who participated in the study had limited perspectives about the causes, identification, and intervention of RWD and inclusive education. They were resourceful about classroom strategies to assist learners with RWD, but largely believed that special education schools are the most appropriate for these learners. Participants agreed to retraining.

Study 2 showed that the STLD results did not match parental satisfaction with their child's academic performance. Most parents were satisfied, but the STLD indicated that all their children were at risk of Specific learning disorder (SLD). Most parents identified RWD in their children when descriptions were given, but attributed laziness as the main cause thereof. Parents showed limited perspectives about causes and symptoms of RWD, and the SLT's role. This implied that the parent participants could often identify RWD in their children, but would rarely seek appropriate intervention from an SLT.

In Study 3, the CELF-5 ORS showed a wide range of difficulties for the RG in speaking, listening, reading, and writing. Significant differences transpired between the RG and CG regarding reading and spelling. The RG mean spelling age was 5.5 years. A history of speech and language delay was associated with spelling difficulties ($r_s=-0.27$, $p=0.02$) and the reading difficulties ($r_s=-0.35$, $p<0.001$).

Conclusion.

As far as it is known this is the first comprehensive study on learners with RWD in Mauritius. The study supports the need for training of current and future teachers in RWD and inclusive education. Parents of children with RWD need to be counselled about their child's difficulties and intervention options. SLTs and teachers should collaborate to support learners with RWD and their parents, using inclusive education strategies. A formal literacy intervention program is proposed, promoting RWD prevention, identification, diagnosis, and intervention. By implementing classroom strategies and training teachers, less individual therapy with learners with RWD will be required, thereby utilising the limited number of Mauritian SLTs more effectively.

KEYWORDS

Mauritius

Parental perspectives

Reading and writing difficulties

Teacher perspectives

Speech-language therapist

Specific learning disorder

ABBREVIATIONS

APA:	American Psychiatric Association
ASHA:	American Speech-Language-Hearing Association
CELF-5 ORS:	Clinical Evaluation of Language Fundamentals 5th edition Observation Rating Scale
CG:	Control group
DSM-5:	Diagnostic and Statistical Manual of Mental Disorders, 5th edition
GORT-4:	Gray Oral Reading Test 4th edition
fMRI:	Functional Magnetic Resonance Imaging
HIC:	High-Income Country
IQR:	Interquartile range
ISO:	International Standardization Organization
LMIC:	Low- and Middle-Income Country
MW:	Mann-Whitney
OS:	Operating system
PoPIA:	Protection of Personal Information Act
RG:	Research group
RWD:	Reading and Writing Difficulties
SD:	Standard deviation
SEN:	Special Education Needs
SLT:	Speech-language therapist
SPSS:	Statistical Package for the Social Sciences
STLD:	Screening Tool for Learning Disorder

CHAPTER 1

INTRODUCTION

Chapter aim: This chapter provides an overview of the latest research in reading and writing difficulties, and specific learning disorder in school-aged children, its causes and contributing factors across different contexts. The rationale and research questions for investigating learners with reading and writing difficulties in Mauritius are presented.

1.1 Background

To promote optimum child development, reading and writing skills are among the fundamental goals of all nations (Richter et al., 2017). Literacy allows learners to achieve their full potential and social inclusion through optimum education (Machel, 2017). The aim of educational systems is to provide in the needs of all learners irrespective of their backgrounds, social status, potential and learning styles (Alawadh, 2016). However, there are a considerable number of learners who have difficulties learning how to read and write to meet academic demands (Vasudevan, 2017). These learners usually continue to obtain lower levels of academic success compared to their peers. They may be labelled as lazy, considered impossible to teach or having intellectual disability by establishments (Cortiella & Horowitz, 2014). There is a possibility that these learners might be experiencing reading and writing difficulties (RWD)[1] or, when formally diagnosed, specific learning disorder which manifests in similar ways (Magombo, 2015). A discussion of the extensive diagnostic framework of specific learning disorder will be used as theoretical background to understand RWD.

According to the American Psychiatric Association [APA] (2013), specific learning disorder is a neurodevelopmental condition that manifests itself as 'difficulties learning and using academic skills, as indicated by the presence of at least one of a collection of specific symptoms that have persisted for at least six months, despite the provision of interventions that target those difficulties' (APA, 2013: 66). The symptoms include (1) inaccurate, or slow and effortful word reading; difficulties with (2) reading comprehension; (3) spelling; (4) written expression; (5) mastering number sense, number facts, or calculation; (6) and mathematical reasoning (APA, 2013). Specific learning disorder therefore affects one or more of the basic cognitive

[1] The term reading and writing difficulties (RWD) will be used as a generic term instead of the diagnosed condition of specific learning disorder, as almost all children in Mauritius experiencing RWD are not diagnosed due to a lack of services and appropriate professionals.

processes required for understanding or use of spoken or written language. The disorder may manifest itself in an inadequate ability to 'listen, think, speak, read, write, and spell or to do mathematical calculations' (APA, 2013:67). As a result, the learner's academic skills are below the average range of scores in all culturally and linguistically appropriate tests of reading, writing, or mathematics. Furthermore, the Diagnostic and Statistical Manual of Mental Disorders, 5th edition [DSM-5] (APA, 2013) states that these difficulties cannot be accounted for by inadequate schooling, lack of proficiency in the language of learning and teaching, or psychosocial adversity. Specific learning disorder should also not be confused with learning difficulties due to other conditions within the learner, like intellectual disability, visual and hearing impairment, and other mental or neurological disorders. Specific learning disorder therefore impedes someone's ability to learn or use specific academic skills that form the foundation for other academic learning. With so many exclusionary conditions that should be considered to make a valid diagnosis, specific learning disorder requires extensive knowledge and expertise from professionals involved in the identification, diagnosis and intervention.

As stated in the DSM-5, specific learning disorder is categorised according to different academic domains namely impairment in reading, written expression and numeracy (APA, 2013). The largest portion of learners with specific learning disorder have impairment in reading, alternatively known as developmental dyslexia (Wagner et al., 2020). It is estimated that dyslexia impacts at least one in 10 people in the world (Dyslexia International, 2014). Learners with dyslexia may present with additional domains of specific learning disorder which may exacerbate their learning difficulties (Kohli at al., 2018). Dyslexia primarily affects the skills involved in accurate and fluent word reading, spelling, writing and reading comprehension (Alt et al., 2017). Learners with reading impairments may vary considerably in their profiles. They may demonstrate problems with learning to read new words accurately when not applying the regular mappings between letters and sounds, also referred to as phoneme-grapheme correspondence, resulting in poor phonological recoding or decoding (Boros et al., 2016). Impaired phonological awareness, the ability to identify and manipulate individual sounds in spoken words in the preschool years play a role in difficulties with phoneme-grapheme correspondence, thereby showing that the origins of RWD start very early before school (Lysaker et al., 2016; Patscheke et al., 2018). Other reading profiles may present as difficulties to read new words that do not follow the regular phoneme-grapheme correspondence, therefore lacking memory representations of written words, also described as poor visual word recognition (Kastamoniti et al., 2018). In contrast, some learners with reading

impairment have accurate phonological recoding and visual word recognition but struggle to read words fluently (Martins & Capellini, 2021). Other learners may show intact phonological recoding and visual word recognition and reading fluency but struggle to understand the meaning of what they read (Spencer & Wagner, 2018). Learners with RWD and specific learning disorder have a complex behavioural profile. Evidence emerging from neuroimaging studies underscores the complexities on a neurological level.

There have been numerous studies investigating the underlying neurological alterations in learners with specific learning disorder such as reading impairments and impairments in written expression. Neuroimaging studies focusing on the reading-related neural systems in learners with dyslexia reveal cerebral disruptions at an early age (Fletcher & Grigorenko, 2017). The neural correlates of dyslexia are commonly linked to the temporoparietal cortex, the occipitotemporal cortex, and the inferior frontal cortex in the left hemisphere (Xia et al., 2017; Yan et al., 2021). The posterior superior temporal gyrus which is involved in phonological analysis tends to show reduced brain activation in individuals with reading impairments in alphabetic languages like English, French and Mauritian Creole, as demonstrated in a crosslinguistic study (Yan et al., 2021). The left occipitotemporal area, including the middle occipital gyrus, inferior temporal gyrus and fusiform gyrus region are associated with visuo-orthographic processing for reading proficiency and during reading acquisition (Kronbichler & Kronbichler, 2018; Glezer et al., 2019). Reduced activation in individuals with reading impairment across morpho-syllabic (like Mandarin and some other Asian languages) and alphabetic languages has consistently been shown in this region (Cao et al., 2018; Centanni et al., 2019; Chyl et al., 2021; Paz-Alonso et al., 2018). Using magnetic resonance imaging (MRI) investigation, grey matter volume often shows hypoactivation and reduced volumes in the left occipitotemporal area as well as temporoparietal cortex, with hyperactivation and increased volumes in the posterior right hemisphere in at-risk prereaders (Ostertag et al., 2021). These grey matter alterations are associated with a delay in language acquisition and a family history of developmental dyslexia (Raschle et al., 2017).

Impaired reading acquisition has also been associated with atypical structural properties of the brain's white matter. The findings of Žarić et al. (2018) suggest differential contributions of cortical and thalamo-cortical pathways to the developing reading network in dyslexic and typical readers. Differential contributions of these pathways possibly indicate prolonged letter-by-letter reading or increased attentional and/or working memory demands in learners with dyslexia during reading (Žarić et al. 2018). A number of cortical areas as well as white matter

pathways may therefore be affected in the brain functioning of learners with RWD. As indicated by Raschle et al. (2017) grey matter alterations in particular appear to be associated with developmental language disorder and developmental dyslexia, thereby showing the link between the two disorders.

Difficulties in spelling may be due to impaired procedures in retrieving the sequence of spelling representations and other processes implicated in a broad range of cognitive functions (McCloskey & Rapp, 2017). The deficiency within the cognitive writing system produces impaired writing performance such as underdeveloped orthographic long-term memory and deficient knowledge of sound-spelling correspondence rules (Hanley & Sotiropoulos, 2018; Hepner et al., 2017). Another cause of spelling difficulties is the failure to encode or retain information about the ordering of letters in a word, resulting in deficient orthographic long-term memory representations (Cidrim & Madeiro, 2017; Hepner et al., 2017).

The third domain under the category of specific learning disorder is impairment in numeracy and mathematics, also known as dyscalculia (APA, 2013; Hoof et al., 2017). It is estimated that four to six percent of learners among the general population are dyscalculic (Bird, 2017). Impairment in mathematics learning involve difficulties acquiring number concepts and words, understanding mathematical concepts, performing arithmetic operations such as adding, subtracting, multiplying (Miundy et al., 2019). Some characteristics of dyscalculia include an inability to judge numbers or understand number concepts, difficulty in memorizing and remembering number facts, resulting in an inability to solve basic arithmetic operations (Yoong & Ahmad, 2020; Yoong & Ahmad, 2021). Studies investigating individuals with impairment in mathematics show differences in brain structure, function and connectivity, affecting mainly the parietal lobe, but also the temporal and prefrontal brain regions (Dresler et al., 2018). Describing the neural correlates for RWD and specific learning disorder is complex and not always clear, but multiple pathways are involved, giving rise to impairments in reading, writing and mathematical skills. Learners with RWD often need a multidisciplinary diagnostic team including at least a psychologist, speech-language therapist, and an occupational therapist to exclude intellectual disability, neurological disorders, visual/hearing acuity problems or inadequate schooling. RWD may represent a specific type of dysfunction in cognitive process before reaching a diagnosis. (Shah et al., 2019).

1.2 Factors contributing to reading and writing difficulties

While underlying neurological impairments shown by neuroimaging studies are explained as causes of specific learning disorder, research also indicates that many factors contribute to RWD. Henrique and Madeira (2017) describe various intrinsic and extrinsic factors that contribute to learner's reading and writing skills. Intrinsic factors involve psychological and biological factors within the learner such as genetic predisposition, and a parental history of RWD. Learners with a positive parental history of RWD show significantly poorer emergent literacy skills and weaker performance at school in comparison to those whose parents do not exhibit any RWD (Esmaeeli et al., 2017; Snowling & Melby-Lervåg, 2016). Van Viersen et al. (2018) found that reading comprehension in Grade 6 learners are directly related to parents with a history of RWD in school.

Extrinsic factors contributing to RWD involve socio-familial, pedagogic, and socio-cultural aspects. The amount of language exposure at home is an extrinsic factor related to the learner's socio-familial and socio-cultural background (Marjanovič-Umek et al., 2017; Nag et al., 2019). Research has consistently shown links between the home literacy environment and early language and emergent literacy development in children (Lau & Richards, 2021). A stimulating home literacy environment contributes significantly to receptive and expressive language development in children at an early age, promoting better listening comprehension skills (Castro & Barrera, 2019). Learners with better listening skills develop phonological awareness which leads to improved letter name recognition and letter-sound knowledge due to increased frequency of exposure to parent-child book reading (Caglar-Ryeng et al., 2020; Krijnen et al., 2021). If the child is not given the opportunity at home to use materials that are associated with the language of learning and teaching in school, reading ability may be delayed (Hemmerechts et al., 2017).

Esmaeeli et al. (2019) propose a multifactorial model to examine reading difficulties and family risks in learners. The model includes both the learner's emergent literacy development and environmental factors such as the home literacy environment and parental level of education. The authors showed that family risks like disadvantaged home literacy environments increase the likelihood of developing reading difficulties and delays in emergent literacy (Esmaeeli et al., 2019). It is clear that environmental factors such as the quality and quantity of reading-related activities that parents provide for their children at home play an important role in the development of learner's emergent literacy and oral language skills (Dilnot et al., 2017; Hamilton et al., 2016; Van Bergen et al., 2017). Research further indicates that success in

reading and writing at school depends on the competence of teachers in adapting their teaching methods, parental involvement during school years, the presence of genetic risks for RWD, exposure to reading materials at home, the presence of co-morbid disabilities, collaboration between teachers and parents, and providing early additional support and stimulation (Austin & Vaughn, 2016; Axelsson et al., 2020; Ozturk et al., 2016).

A study by Mohammed and Amponsah (2018) in the Tamale Metropolis, Ghana showed that teachers and parents do not succeed in stimulating an interest and increasing learners' motivation for reading. Schools and parents appear reluctant to encourage learners to develop positive attitudes towards reading while there is inadequate parental involvement in assisting their child to learn how to read fluently at home. The study also highlights certain factors that impede reading skills like parents' own limited reading level and practices. The same study found that schools do not motivate learners to read story books and word cards because there are no activities such as reading competitions to motivate reading. Moreover, teachers themselves do not possess the skills to teach learners how to read because they are not well-trained in classroom strategies to instruct reading and attract learners' interest in reading. (Mohammed & Amponsah, 2018).

1.3 The teacher's role in intervention of learners with reading and writing difficulties in an inclusive education system

Teachers play an essential role in the initial identification of learners with RWD by observing their academic performance in relation to their cognitive profile (Fletcher et al., 2018; Indrarathne, 2019; Vasudevan, 2017). Learners with RWD and specific learning disorder are more likely to be successfully integrated in a regular classroom than learners with more severe disabilities (Deva & Kumar, 2015; Kavkler et al., 2015). Teachers are responsible for creating an inclusive environment through individualised targeted support in the teaching-learning process (Virinkoski et al., 2020).

Unfortunately, teachers working in mainstream schools may have insufficient knowledge about RWD and specific learning disorder (Chimire, 2017; Kalsoom et al., 2020; Washburn et al., 2017). Alawadh's (2016) study in the Arabic context, and Indrarathne's study (2019) in Sri Lanka show that teachers have minimal understanding of specific learning disorder and inclusive education. The study by Indrarathne (2019) showed that the participating teachers in Sri Lanka believe that there is lack of effort from learners in meeting academic demands. The finding indicates a need to organise intensive in-service training programs for teachers to

update their skills on contemporary developments in the school system (Eyo & Nkanga, 2020). Martan et al. (2017) found that teachers in Croatia who are knowledgeable on dyslexia have positive attitudes towards those learners. Kormos and Nijakowska (2017) and Indrarathne (2019) provided evidence that systematic teacher training in specific learning disorder and inclusive education practices can inculcate positive attitudes among teachers, thereby increasing their self-efficacy and confidence in implementing inclusive practices.

Even though teachers' lack of knowledge about RWD in regular classrooms is an important aspect that needs attention in many countries, there are some practical problems that may limit implementing inclusive practices. For example, due to large the teacher-learner ratios, teachers are unable to pay sufficient attention to the individual needs of learners (Yada & Savolainen, 2017). Teachers may also not have sufficient access to reference materials to understand techniques, technology, and tools to design teaching aids (Bhatnagar & Das, 2014; Indrarathne, 2019; Yada & Savolainen, 2017). Several institutional barriers such as a rigid curriculum which needs to be completed within a limited time tends to reduce teachers' ability to thoroughly pay attention to individual learner needs. Hence, they are forced to follow a 'one size fits all' model, resulting in learners with difficulties either dropping out or not achieving the expected educational goals (Lübke et al., 2021; Zwane & Malale, 2018).

1.4 Parental involvement in reading and writing development

During school years, there is a need for reliance on the support parents give to children in developing reading and writing skills (Villiger, 2020). Parents could help with homework and other school related matters as the family environment facilitates adaptive and valuable one-to-one interaction with the child (Villiger, 2020). Thus, parental involvement in children's acquisition of reading and writing is of great importance. Parents play a key role in encouraging and stimulating their child's age-appropriate oral language and literacy development and increase vocabulary and phonological awareness through stories and books from birth onwards (Altınkaynak, 2019; Dong et al., 2020). To develop emergent literacy skills, parents should also familiarise their child with letters of the alphabet and their sounds, basic print concepts, and identifying shapes in early childhood (Manten et al., 2020; Mohammed & Amponsah, 2018). However, parental support with a child's schoolwork can be a challenge. Parents often lack the necessary content knowledge and pedagogical skills to assist a child (Garbe et al., 2020; Lima & Kuusisto, 2019). "Teaching-learning" situations are usually atypical at home and may disrupt parent-child relationships, impacting the child's achievement (Villiger, 2020).

Since parental involvement in their child's academic work is a powerful correlate of scholastic achievement (Hemmerechts et al., 2017), they can provide valuable information about their child's RWD. Parents need to be made aware of their child's RWD as early as possible so that appropriate intervention can be initiated (Ismail et al., 2018). Parents are encouraged to join relevant support groups to share their experiences in raising their children with RWD (Rauf et al., 2021). Research evidence underscores the importance of parents in children's reading and writing development. Support for early language development and home literacy environments can ameliorate or possibly prevent RWD (Guo et al., 2021; Hofslundsengen et al., 2019; Puranik et al., 2018). A study by Hofslundsengen et al. (2019) showed that children's vocabulary and phonological awareness were better when more frequent literacy activities and shared reading were carried out by parents. Guo et al. (2020) found that learners' writing and spelling abilities were dependent on the extent to which learners engage in independent reading and writing at home. For an effective intervention program for learners with RWD, it is important that positive attitudes and perspectives of parents regarding their child with RWD are facilitated (Sahu et al., 2018).

1.5 The role of speech-language therapists in the diagnosis and intervention of reading and writing difficulties

Speech-language therapists (SLTs) are uniquely trained in assessment and intervention of learners with RWD by supporting teachers to assist leaners to succeed in classroom activities and academic demands (McLean et al., 2021). The scope of practice of an SLT in the intervention of learners with RWD mainly involve addressing underlying difficulties (American Speech-Language-Hearing Association [ASHA], 2010). SLTs may focus on decoding skills, phonological and morphological awareness skills, and working memory to improve reading and writing skills (Adubasim, 2018; Gillon & Macfarlane 2017; Holmes & Dunning, 2017; Schiff & Joshi, 2016). SLTs collaborate with parents, teachers, and other team members to help determine whether a full diagnostic assessment by a qualified professional is required for a learner with RWD (ASHA, 2016; Glover et al., 2015). SLTs have well established their role in addressing literacy skills and often work as part of a team in schools to improve learners' reading and writing (Giacovazz et al., 2021; Moxam, 2020). SLTs also play a key role in building literacy foundations such as language development and phonological awareness in the preschool years (Barton-Hulsey et al., 2018). Although teachers are knowledgeable about curriculum and instructional design, many may feel inadequately prepared to implement inclusive education (Thompson et al., 2015). They may not be aware of

how to support learners with speech-language, and communication needs in the general classroom. SLTs have knowledge about language-based learning difficulties and supports needed to enhance successful learning (Campbell et al., 2016). Since language deficits are strongly associated with reading and writing difficulties, SLPs plays an integral role in its intervention in collaboration with teachers in order to facilitate access to the curriculum (Navas et al., 2017).

1.6 Study rationale and research questions

According to the National Strategic Paper "Special Education Needs and Inclusive Education in Mauritius" (2006), the island currently employs a special educational approach for learners with disabilities. Mauritius considers the implementation of inclusive education as a fundamental part of the social justice framework based on the Salamanca Statement in 1994 (Haug, 2017). Inclusive education as an important prerequisite to ensure equal educational rights for all persons with varied special educational needs is acknowledged (Ministry of Education, 2006). There are special education needs (SEN) schools that provide services to learners with physical, visual, hearing, and intellectual impairments or other special education needs. Education statistics of 2017 in Mauritius showed that the total number of learners in SEN schools was 2,656. Among these learners, 144 (5.4% of the total of 2,656) were learners diagnosed with dyslexia, with 117 of the 144 being boys and 27 girls. The number of learners with RWD in mainstream government schools, i.e., learners with RWD in an inclusive education setting has not been documented. There is limited information about how learners with RWD are identified and what are the intervention options available for them in Mauritius. It is anticipated that research would contribute to the education system of Mauritius by identifying the characteristics of learners with RWD. A better understanding of the characteristics of learners with RWD and needs of teachers and parents may lead to the development of more efficient interventions to maximize learner potential.

RWD occurs in all cultures, across a range of academic domains, in particular reading, writing and mathematics, and are influenced by socio-economic backgrounds (Shifrer et al., 2010). Failure to recognise learners with these difficulties can lead to low self-esteem, anger, behavioural problems, and depression in such learners (Novita, 2016; Huang et al., 2020). Key role players in the education of a child are teachers and parents. By observing the academic performance of learners, teachers are the first to identify early signs of learning difficulties (Fletcher et al., 2018; Vasudevan, 2017). However, learners with RWD may remain unnoticed in crowded classrooms which may lead to delayed identification and intervention. Similarly,

parents may not recognize the presence of a learning difficulty or do not feel that there is a need for immediate action due to lack of awareness about RWD and specific learning disorder (Sahu et al., 2018).

Despite advances in research regarding assessment and early intervention for learners with RWD in many countries across the world, it appears that no one has investigated to what extent such mediation can be implemented in Mauritian schools. In Mauritius, it is frequently observed in SLT clinical practice that parents may leave the child to continue with regular teachers or private tutors without any appropriate intervention or they may terminate remedial education prematurely. In addition, due to poor awareness about RWD and specific learning disorder, parents may not consult psychologists, occupational therapists, SLTs or special educators. Parents may only become concerned when the child reaches the fourth grade where academic demands increase, when signs of frustration in the child escalate and complaints from the school are recurrent. There is a need to determine the level of awareness of parents and teachers about RWD in Mauritius. Research data may indicate the necessity for workshops and education about RWD to promote awareness, knowledge and intervention options. Without knowledge, extraordinary changes cannot be expected.

To date, no research study could be found investigating RWD among young learners in mainstream government schools in Mauritius. The study is conducted within the education system with specific interacting stakeholders, i.e. teachers and parents. The primary education in Mauritius is acquired from Grade 1 at age five, to Grade 6. Grade 4 learners (8 to 9 years of age) can be considered as the most appropriate study population for such an investigation in Mauritius. A child is typically able to read and write independently at sentence level to meet the academic demands by Grade 4 (Horowitz-Kraus et al., 2017). The rationale of the study leads to the following research questions:

1) What are the perspectives of mainstream primary school teachers in Mauritius about learners with RWD and inclusive education? Which factors are associated with their views, and to what extent they are ready to support learners with RWD in a regular classroom?
2) What are parents' perspectives about their child in Grade 4 with reading and writing difficulties in mainstream government schools in Mauritius?
3) What are the characteristics of Grade 4 learners with difficulties in reading and writing in Mauritian mainstream government schools?

This is an article-based thesis, where Chapter 1 provides an introduction to the topic and Chapter 2 gives a comprehensive discussion of all methods used in the three studies. The three studies follow in Chapters 3, 4 and 5, using the formatting required by the different journals where published or submitted. Chapter 6 provides a summary of the research, implications and conclusion.

CHAPTER 2

METHOD

Chapter aim: This chapter states the aim and objectives of the research project. A detailed description of the different methods used to conduct each of the research studies is provided.

2.1 Research aim and objectives

The aim of this study was to investigate the characteristics of Grade 4 learners with reading and writing difficulties (RWD) in mainstream government schools in Mauritius and the perspectives of their parents and teachers.

The three dimensions of studying RWD in Mauritius are shown in Figure 2.1. The research consisted of three studies, each with its own objectives, methods, study participants and ethical considerations.

Research objectives

1) To describe the perspectives of mainstream primary school teachers in Mauritius about learners with RWD and inclusive education, which factors are associated with their views, and to what extent they are ready to support learners with RWD in a regular classroom.
2) To determine parental perspectives regarding their Grade 4 children with RWD in mainstream government primary schools in Mauritius.
3) To describe the characteristics of Grade 4 learners with RWD in mainstream government schools in Mauritius.

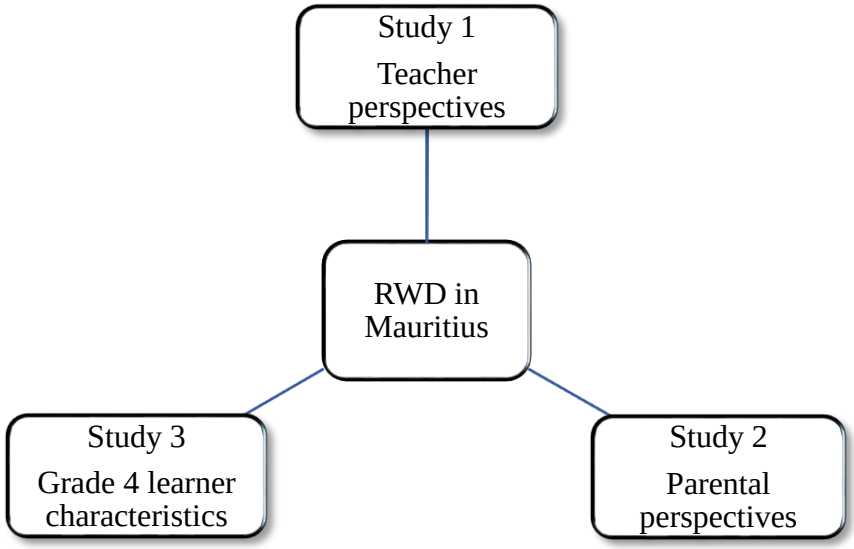

Figure 2. 1 Investigating three dimensions of RWD in Mauritius

2.2 Research studies

All three studies have been submitted and/or accepted for publication in accredited, peer-reviewed journals. The titles and journals of publication are summarised in Table 2.1.

Table 2. 1 Summary of research studies

	Study 1	**Study 2**	**Study 3**
Title	Teachers' perspectives on learners with reading and writing difficulties in mainstream government primary schools in Mauritius	Parental perspectives on their Grade 4 children with reading and writing difficulties in mainstream government schools in Mauritius	Grade 4 learners with reading and writing difficulties in mainstream government schools in Mauritius
Journal of publication	South African Journal of Childhood Education	International Journal of Education	South African Journal of Communication Disorders
Publication status	Accepted and published See Appendix A	Accepted for publication See Appendix B	Under review See Appendix C
Chapter in thesis	3	4	5

2.3 Research design

Study 1 and 2 employed a descriptive quantitative and qualitative research design using a survey research method. Survey research is most applicable when describing and exploring human behaviour, thoughts and feelings, in this case, perspectives of participants (Ponto, 2015). There may be various data collection methods employed in survey research with the most common being interviews and questionnaires (Ponto, 2015). In these two studies, self-completed questionnaires were used, consisting of both open and close-ended questions to gain in-depth understanding about teachers' and parents' perspectives and experiences regarding Grade 4 Learners with RWD (Kumar, 2018).

Study 3 followed a descriptive comparative research design. A descriptive study describes a situation, subject, behaviour, or phenomenon, attempting to answer questions of 'who, what, when, where, and how' associated with a research problem (Creswell & Creswell, 2017). Thus, through the comparative design, the characteristics of Grade 4 learners with RWD (research group [RG]) were described when compared to a control group (CG) of typically performing learners. Correlations of interest were determined which may contribute to understanding how behaviours are related.

2.4 Research context

Mauritius has already adopted an inclusive education policy for learners with special education needs in 2006 (Ministry of Education and Human Resources, 2006). The policy is based on broader international guidelines such as the Salamanca Statement (UNESCO, 1994) and UNESCO (2005). A new policy framework and strategy received governmental approval in 2017. This framework and strategy include several tactical goals to ensure parity and equity of education, inclusion, and integration of all learners in the system along with the development of quality materials and equipment for a robust inclusive education system (Ministry of Education and Human Resources, 2017). The policy framework has yet to be implemented.

The education system on the island of Mauritius includes 319 mainstream primary schools. The majority (221) of the schools is run by government, 51 by the Roman Catholic Education Authority, two by the Hindu Education Authority and the remainder 45 are private non-aided schools, all serving a population of 1.2 million people (Education statistics, 2020). The schools are divided into four geographical zones across the island.

At present there are only two SLTs employed by the Ministry of Education, Tertiary Education, Science and Technology[2] to provide services to learners with communication disorders and special education needs. Therapy occurs on an individual basis and according to the pull-out intervention approach which includes the learner receiving intervention individually or in small groups with the therapist in another setting outside of the general classroom (Sylvan, 2018). Data for the respective research studies were collected from government primary schools in Zone 2, an area with a near equal number of urban and rural schools and is therefore representative of government primary school teaching environments in Mauritius.

Study 1

While learners with severe and obvious learning difficulties are accommodated in special education schools in Mauritius, those with more subtle difficulties, like RWD remain in regular classrooms, but teachers do not receive additional training to assist them. Because teachers play a key role in the intervention of learners with RWD their perspectives were significant to investigate.

Study 2

Based on personal communication with SLTs in Mauritius, it is frequently observed that parents may leave the child with learning difficulties to continue with regular teachers or private tutors without any appropriate intervention or they may terminate remedial education prematurely. Research about learners with RWD in Mauritius would be incomplete if their parents' perspectives are not considered. Hence, there is a need to determine the level of awareness of parents and their perspectives about RWD in Mauritius. Research data may indicate the necessity for, and nature of, workshops and education about RWD to promote awareness among parents.

Study 3

Mauritius is a multilingual island, with a dichotomy between the use of oral and written languages. While Mauritian Creole dominates as the most frequently spoken first language of the population, English and French are the main print languages, as well as the main languages for literacy and education (Owodally, 2013; Sonck, 2005). In such a complex linguistic situation, it is important to describe the characteristics of learners with RWD.

[2] The Ministry of Education and Human Resources changed its name to the Ministry of Education, Tertiary Education, Science and Technology in July 2020

Learners in Mauritius start their education in mainstream primary schools from the age of five years (Ministry of Education and Human Resources, 2006). When learners with RWD cannot adapt in mainstream schools, parents and teachers may request admission to special education schools operated by non-governmental organisations registered with the Ministry of Education, Tertiary Education, Science and Technology (Special Education Needs Authority Act, 2018). A learner with RWD with no visible disability may remain in a regular classroom in a mainstream government school for the duration of their education without receiving appropriate intervention. The regular classroom environment might not necessarily foster their reading and writing skills as inclusive education practices are not used. They tend to lag behind their peers in meeting the demands of the curriculum. Learners with difficulties may have access to support classes during Grade 1 and 2, made available by the Ministry, but may never be assessed by a SLT or another professional. This study may highlight the needs of learners with RWD.

2.5 Research participants

Permission was obtained from the Ministry of Education Tertiary Education, Science and Technology to conduct research in schools (see Appendix D) for the letter of request and permission granted). Participants utilised in all three studies were recruited from the same 20 schools in Zone 2, randomly selected from a list of government primary schools obtained from the Department of Primary Education in Mauritius. Using a lottery method, an even number of schools from urban and rural areas was selected and permission from the school principals to conduct the research was obtained (Appendix E).

Study 1

After obtaining permission for data collection from all selected schools (see Appendix E for permission letters from a selection of five out of the 20 schools) teachers from each school were informed about the study, approached to participate, and requested to give informed consent (Appendix F). From the 20 schools, four to six teachers per school agreed to participate in the study. For participants to be included in the study, they had to be primary school teachers, aged between 25 to 60 years, with at least a diploma qualification and teaching for a minimum of three years. A total of 100 primary school teachers could be recruited to participate in the study. Participant characteristics showed that 71% were female and 29% were male and aged between 22 and 57 years (mean=36.59, Standard Deviation [SD]=7.47). All participants could be considered as well qualified as their minimum teaching training level was a diploma in

education and the maximum was a bachelor's degree in education. Some participants had a postgraduate degree.

Study 2

Learners with RWD in Grade 4 in the same 20 schools were identified after being screened with the help of their class teachers, with the Screening Tool for Learning Disorder (STLD), developed and validated by Vidyadharan et al. (2017). All learners who obtained a score above 10 were regarded as learners with RWD. Their respective parents were then approached to participate in the study. Data collection was conducted during the last term of the 2020 school year, when the parents had already received at least two school reports of the academic performance of their children. At that stage parents should have been aware of their child's poor academic performance in school, which could have motivated them to participate in the study. A total of 67 parents gave informed consent to participate in the study (Appendix G). The sample consisted of mothers (58.3%), fathers (31.3%) and legal guardians (10.4%), between ages of 20 to 30 years (34.3%), 31 to 40 years (47.8%), and 41 to 50 (17.9%). The highest education level of the majority was a Cambridge school certificate which comprises of 11 years of school (74.6%).

Study 3

Participants for Study 2 and 3 were recruited simultaneously. As indicated earlier, learners with RWD in Grade 4 classes were identified by teachers with the STLD (Vidyadharan et al., 2017). All prospective participants' parents were approached to give informed consent that their children could participate in Study 3 and that they participate in Study 2 (Appendix G). Inclusion criteria were as follows: Participants had to be learners in Grade 4, aged between eight and nine years old, and attending a government primary school at the time of data collection. The RG consisted of learners with RWD identified with the STLD. A total of 67 participants with RWD were included in the study. The CG comprised of 49 typically achieving learners without any RWD, randomly selected by their teachers based on their latest exam performance in class. Parents gave informed consent (Appendix H).

The presence of hearing difficulty in both groups was ruled out by a hearing screening test, validated by Mahomed-Asmail et al. (2016) for school children. All participants had audiological thresholds within normal limits (below 15dB) across three frequencies: 500, 1000, and 2000Hz. All but one participant passed the hearing screening. This participant was then referred for diagnostic testing and eliminated from the study sample. There were no visual

difficulties observed, but five participants in the CG wore spectacles at the time of data collection. No screening for intellectual disability, neurological disorders, attention deficit hyperactivity disorder or autism was conducted, as the aim of the study was to describe undiagnosed RWD in learners, irrespective of the underlying cause.

The RG (n=67) consisted of 38 (56.7%) boys and 29 (43.3%) girls with a mean age of 9.0 years (SD=0.5). The CG (n=49) consisted of 30 (61.2%) boys and 19 (38.8%) girls with a mean age of 9.3 years (SD=0.32). There were no significant differences in the gender distribution between the two groups (p=0.626). Although the participants' mean age differed significantly between the groups (p=0.003), both groups had had the same educational opportunities and experience.

2.6 Material and apparatus

Teacher questionnaire (Appendix I)

The perspectives of teachers were determined by means of a questionnaire in English, compiled and adapted from Lopes and Crenitte (2013) and Alawadh (2016). No single published questionnaire could be found that would capture teacher perspectives of the Mauritian mainstream education system. The questionnaire comprised of four sections according to topics related to the demographic characteristics of the participants, their perspectives about learners with RWD and its causes, inclusive education, and what they are doing to support such learners in mainstream government primary schools.

Parent questionnaire (Appendix J)

A questionnaire was compiled in English as parents in Mauritius are expected to be able to read and understand English and since the participants' minimum qualification was a Cambridge school certificate. Questions in the questionnaire have been used in studies by Zivoder et al. (2017) and Johney et al. (2015). The questionnaire comprised of questions related to the following areas of research interest: (1) Demographic details of parents having a child with RWD; (2) Medical and developmental history of their child with RWD; (3) Parental descriptions about the symptoms and their perceived causes of the child's RWD; and lastly, (4) Ways in which they assist their child with RWD. Multiple choice closed-ended (Yes/No) questions and open-ended questions were included. Some of the data from the questionnaire were also used in Study 3 to describe the demographics of the RG.

Screening Tool for Learning Disorder (Appendix K)

The STLD (Vidyadharan et al., 2017) is a valid and reliable tool which can be used by teachers or parents to identify learners with specific learning disorder. The tool contains 26 items requiring YES/NO responses from the domains of reading, writing, spelling, and mathematics, thereby including all domains and subskills that can be impaired in specific learning disorder (APA, 2013). A score of 11 to 20 indicates a need for an assessment to confirm specific learning disorder and a score of >20 already signals specific learning disorder.

Clinical Evaluation of Language Fundamentals, 5th edition Observation Rating Scale

The Clinical Evaluation of Language Function, 5th edition Observation Rating Scale [CELF-5 ORS] (Wiig et al., 2013) was independently completed by the RG participants' class teachers to cross-verify the findings of the STLD. The CELF-5 ORS was used to obtain a systematic observation of listening, speaking, reading and writing skills of the RG in the classroom. The CELF-5 ORS is typically used by teachers so that they can self-identify learners with language-based learning difficulties and refer them for assessment and diagnosis.

Gray Oral Reading Test, 4th edition

The Gray Oral Reading Test 4th edition (GORT-4) (Wiederholt & Bryant, 2001) is widely known as an objective measure of oral reading progress and diagnosis of oral reading difficulties. Four different scores provide comprehensive information about a learner's oral reading skills: Rate (the amount of time taken by a learner to read a story); Accuracy (the learner's ability to read each word in the story correctly); Fluency (the learner's rate and fluency scores combined) and Comprehension (the appropriateness of the learner's responses to questions about content of each story read).

The GORT-4 includes two forms A and B, containing 14 developmentally sequenced reading passages each and five comprehension questions related to each passage. The different forms are used for follow-up assessments so that the same passages are not used during a second administration of the test. Standard scores, percentile ranks, grade equivalents, and age equivalents are provided for each score. Form A was used in this study. Since studies show an absence of bias for gender and ethnicity in the GORT-4 stories and questions, it appeared to be an appropriate test to use in Mauritius (Craig et al., 2004; Speltz et al., 2017). The participants were expected to be able to use English at a certain level as English is the language of learning and teaching in Mauritius. The GORT-4 were pilot tested with 10 typically achieving Grade 4 Mauritian learners. The results showed that these learners could complete the test according to

their age and grade level without any difficulties with respect to word familiarity and English comprehension level.

Schonell Spelling Test

The Schonell Spelling Test (Schonell, 1952) consists of a list of 100 graded words, which are read out aloud while the participants wrote the words. The test is widely used by practicing psychologists and special educators to provide reliable results about spelling errors and spelling age of learners across grade levels (Chmilar, 2016). The words used in the Schonell Spelling Test appeared to be appropriate for the Mauritian population. No words with unfamiliar cultural references were identified. To verify the relevance of the tests before data collection, the researcher administered both the GORT-4 and the Schonell Spelling Test to five Grade 4 learners without RWD in Mauritius. The learners were familiar with all words in the spelling test and could read the passage on Grade 4-level without any difficulty.

Apparatus

Smartphone Hearing Screening

The hearScreen™ was used to screen all learner participants' hearing (Mahomed-Asmail et al., 2016). The screen is cost–effective and can be operated on an entry-level smartphone, running an Android operating system (OS). Data were collected with a Samsung Galaxy Pocket Plus S5301 phone, running the hearScreen™ Android OS application with supra-aural Sennheiser HD202 II headphones. The HearScreen™ was programmed using an automated test sequence with a forced choice paradigm. The forced choice requires that after the test operator presented the test signal, the child raises a hand when hearing the tone. The test operator then records whether the child responded to the sound with a YES/NO response on the application. Based on the response, the stimulus intensity and frequency change automatically according to the programmed test protocol. The hearing screening was conducted at 1kHz, 2kHz and 4kHz respectively as recommended for school children. (Mahomed-Asmail et al., 2016).

2.7 Data collection procedures

Study 1 and 2

Data were collected through school visits conducted by the researcher. Although the data collection procedures for the two studies were similar, the completion of the questionnaires by teachers and parents did not take place at the same time. A specific time was arranged where

teachers from each school completed the questionnaires individually at the same time in one room.

To identify learners with RWD, Grade 4 teachers were requested to complete a screening tool for learning disorder by Vidyadharan et al (2017) for each learner with RWD in their class. Once learners were identified, their parents were contacted for a meeting at their convenience at their child's school. The purpose was to obtain informed consent to participate in Study 2 and for their child to participate in Study 3. The researcher gave basic instructions regarding the questionnaires and reminded participants not to disclose their name on the questionnaire as data had to remain anonymous. The researcher was available for queries regarding the questions, but no information to influence their answers were given.

Study 3

Parents of the RG completed the parent questionnaire, which was used for Study 2 and 3. The researcher familiarised the teachers with the CELF-5 ORS and requested them to complete the scale for the RG. After participants gave assent to participate (Appendix L), the two tests (GORT-4 and the Schonell Spelling Test) were administered individually in a quiet room at their school, according to the test instructions. The administration time for the GORT-4 typically ranged from 15 to 30 minutes. The researcher determined the first reading passage level for each participant by using the entry point according to grade level in the table provided in the examiner's booklet (Wiederholt & Bryant, 2001). Participants were provided with the passage and requested to read it orally as "carefully and quickly as you can" (Wiederholt & Bryant, 2001). Participants' reading was timed with a cell phone stopwatch and deviations from the print were noted as the participant read the passage. Following the reading evaluation, the researcher removed the passage, read the comprehension questions to participants and noted their answers. Testing continued until a ceiling had been reached, determined by the Fluency score. The ceiling is reached when a participant exceeded the maximum number of misread words permitted in the stories. In this study the RG could only read to Story 4 but the CG could proceed as far as Story 12.

Following the reading test the Schonell Spelling Test was carried out. Participants wrote the words on a lined paper, coded at the top. The researcher dictated each word, saying the word individually, then in a sentence and finally repeating the single word again (e.g., time - Can you tell me the time? – time). The dictation was slow and clear, participants were not rushed, and words were repeated as often as needed. The test was discontinued when 10 consecutive

errors were made. The approximate duration of the entire data collection session for the RG was 20 to 30 minutes, whereas the CG required longer time, approximately 45 minutes as they could read more stories in the GORT-4. A summary of the data collection process for Studies 1 to 3 is shown in Figure 2.2. The data collection took place over a period of six months for all three studies.

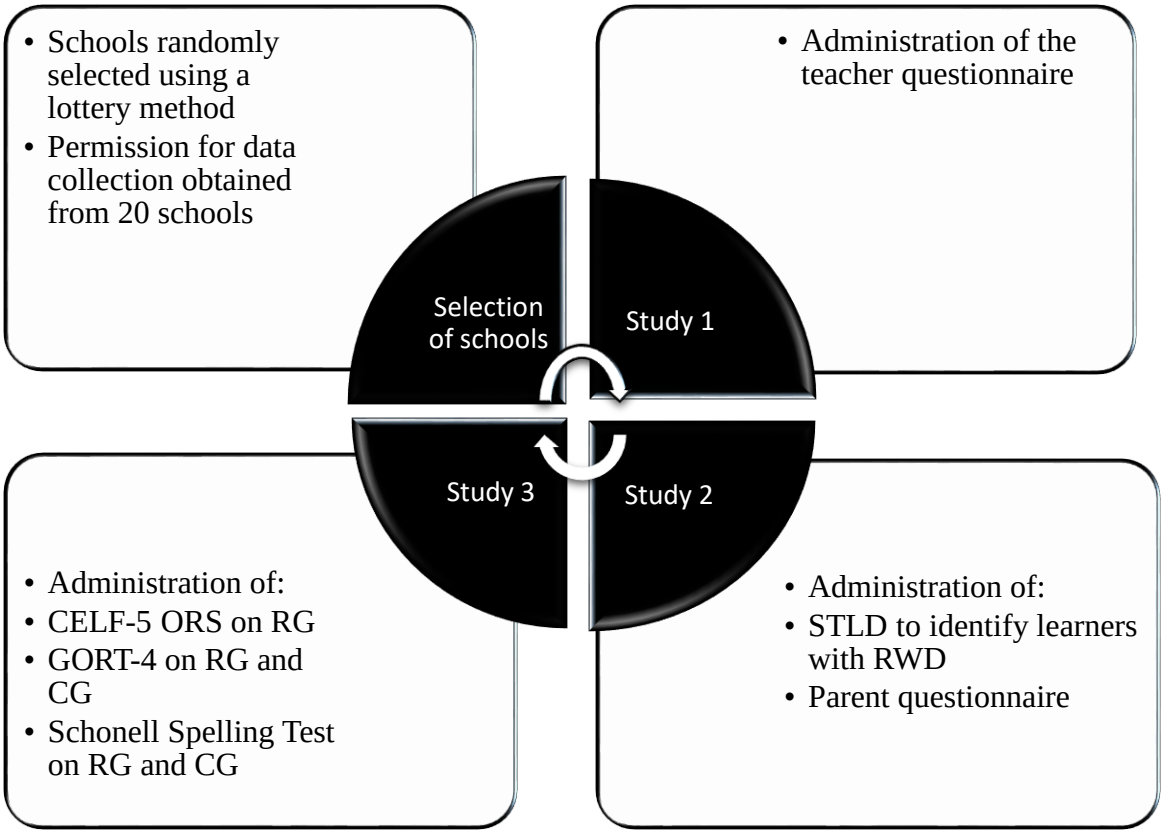

Figure 2. 2 Data collection procedures for Studies 1 to 3

2.8 Data processing and analysis

The SPSS version 26 software was used to analyse the data of all three studies.

Study 1

Quantitative data analysis was carried out in three phases, descriptive analysis, determining associations between variables and factor analysis. Descriptive data derived from the questionnaire responses were analysed and expressed as means, standard deviations and percentages according to the respective categories. Descriptive responses of participants' own words were analysed as main themes. The Chi-square test was used to determine the

relationships between the study variables. Data for Study 1 were further reduced into a small number of key dimensions (factors) using principal component analysis. This was done by determining the degree to which a certain response in the questionnaire correlated with a certain factor. By summarising the relationships among variables in a concise way, existing relationships in the questionnaire responses could be more readily understood.

Study 2

Quantitative data from the questionnaires were firstly interpreted as frequencies and percentages. The continuous variables were tested for normality using the Kolmogorov-Smirnov. If the p-value is greater than 0.05, the data is normally distributed, and parametric tests are used. On the other hand, if the p-value is less than 0.05, the data differ from normality, and nonparametric tests are used. Since the p-value was greater than 0.05 (p=0.059), we assumed normality and the parametric independent samples t-test was used to determine significant differences between independent groups for the continuous variable (score on the STLD). The null hypothesis of the t-test stated that the differences were not statistically significant, whereas the alternative hypothesis stated that it was. If the p-value is less than 0.05, the null hypothesis is rejected, and the differences in scores between the two independent groups are statistically significant.

For categorical data, the Chi-square test for association (hereafter just Chi-square test for brevity) with pairwise z-tests (hereafter just z-tests for brevity) was used. The null hypothesis for the z-test stated that two proportions, between two independent groups, did not differ statistically significantly, whereas the alternative hypothesis stated that it did. If the p-value was less than 0.05, the null hypothesis was rejected, and the proportions differed statistically significantly. As the z-test is an ad-hoc test of the Chi-square, a p-value less than 0.05 can then also be interpreted as having a statistically significant association between the categorical variables. For 2x2 cross-tabulations, the Chi-square test and the z-test are equivalent (had the same p-value), with the small difference that the z-test statistic is the square-root of the Chi-square test statistic. For cross-tabulations larger than this, the z-test has the advantage over the Chi-square test, indicating precisely which percentages differ significantly from each other. Since the z-test was the same as the Chi-square test for 2x2 cross-tabulations, but gives more information for larger cross-tabulations, only the z-test statistics and its corresponding p-values were reported on in Study 2 when working with categorical variables. The qualitative data underwent a thematic analysis.

Study 3

The raw data obtained from the CELF-5 ORS, the GORT-4 and the Schonell Spelling Test were tabulated using alpha-numerical codes to ensure the confidentiality of the participants' data. Scores of the CELF-5 ORS are obtained by calculating the number of statements which obtained a score 1, i.e., the teacher indicated a 'yes' for the statement. The maximum score indicating difficulties (number of 'yes' statements) for listening skills is 14, speaking skills is 24, reading skills is 6 and writing skills is 6. Four different scores namely the rate, accuracy, fluency, and comprehension were obtained from the GORT-4. Standard scores, percentile ranks, grade equivalents, and age equivalents are provided for each score. The spelling scores of the participants were obtained from the Schonell Spelling Test by dividing the total number of words correctly spelled by 10. The number is then added to 5. A conversion table to convert tenths of a year into months is used to obtain the spelling age of participants.

The coded data were analysed using descriptive statistics, such as frequency tallies, percentages, means, SDs and interquartile ranges (IQRs). For continuous variables, we tested for normality using the Shapiro-Wilk test. Since none of the p-values were greater than 0.05, we did not have normality. Accordingly, non-parametric tests were used for statistical analysis of the continuous variables, such as to determine significant differences between the two study groups (Mann-Whitney (MW) test) and correlations (Spearman) between data obtained. Spearman correlations were reported as 'rs' as the custom for non-parametric data. For categorical variables, the two-proportions z-test was used to test for differences between the RG and CG. If the p-value was <0.05, the difference (MW and z-test) or the correlation (Spearman) is statistically significant. Possible correlations were investigated between the outcomes of the STLD used to identify Grade 4 learners with RWD, the CELF-5 ORS, GORT-4 measures, and the Schonell Spelling Test. Correlations between the RG's developmental history obtained through the parent questionnaire and their performance on the GORT-4 and Schonell Spelling Test are described.

2.9 Ethical considerations

Ethical clearance was obtained from the Faculty of Humanities' Research Ethics Committee, University of Pretoria (HUM018/0520) (Appendix M) and the Ministry of Education, Tertiary Education, Science and Technology of Mauritius (Appendix D). Ethical guidelines were followed in order to protect the rights and welfare of the participants who were involved in the study (Leedy & Ormrod, 2014).

Protection from harm

The risk of participating in a research study should never exceed the risks of normal daily living (Leedy & Ormrod, 2014). There were no risks or discomforts involved when participating in this research project. This was clearly indicated, in writing and verbally, when informed consent was obtained. The benefits of participation, however, involved all children being screened and assessed for reading and writing difficulties. If concerns were noted, appropriate referrals were made. The RG were referred for follow up by psychologists, SLTs and occupational therapists through a letter given to the parents (Appendix N).

Voluntary and informed participation

Voluntary participation and informed consent prior to data collection are two of the most important ethical considerations to which a research project should adhere (Xu et al., 2020). Participants were told about the nature of the study and process of data collection prior to obtaining informed consent. An information brochure explaining the purpose of the research was given to all research participants which provided information on the aims, methods, potential risk and benefits of the research studies. Child assent was obtained from the RG and CG before data collection. Consent was voluntary, and no monetary compensation were offered as an incentive to the participants. Participants had the right to withdraw at any time they wish to and were assured that this would not be detrimental to them. Contact details of the researcher and study supervisors were provided on the information brochures. None of the participants withdrew from the study.

Right to privacy and confidentiality

All the data obtained from child participants were accessible only to the researcher and their parents. Caution was taken to maintain privacy and confidentiality of all participants' information (Leedy & Ormrod, 2014). For Studies 1 and 2, participants were requested to complete questionnaires which required no identifying information. Each learner participant who underwent screening, and assessed with the CELF-5 ORS, GORT-4, and Schonell Spelling Test in Study 3, was assigned an alphanumerical code which was used to match the background information to the developmental information obtained from the parent questionnaire used in Study 2.

All raw data (Excel sheets) are now stored electronically on the University of Pretoria's repository as per institutional guidelines. Furthermore, to adhere to the Protection of Personal Information Act (PoPIA) recently accepted in South Africa, no personal information will be available to any outside parties as the repository is protected. Additionally, the repository

adheres to ethical data management practices regarding accountability for the data stored, processing limitation, and security policies by ensuring that only the owners of the data have consent to collect, store, use, and destroy the data.

Truthfulness

All data were reported honestly, and the research findings were published to ensure that the studies are now in the public domain. The published articles have been sent to the Ministry of Education, Tertiary Education, Science and Technology and presented orally to officials in the Ministry. No plagiarism was committed. The research limitations were acknowledged.

2.10 Reliability and validity

Standardised assessment tools were used where possible to investigate Grade 4 learners with RWD. Teachers completed the two screening checklists, the STLD (Vidyadharan et al., 2017) and CELF-5 ORS (Wiig et al., 2013) independently from the researcher. The findings showed significant agreement between the teacher-completed screening checklists and the tests conducted by the researcher. The researcher conducted all tests, thereby ensuring consistent data collection procedures. A strong design was used for Study 3, with an RG and CG comparison. The CG ensured that learners with RWD were not unfairly evaluated using standardised measures developed in other contexts than Mauritius. All articles were peer-reviewed by two reviewers and corrections were made before publication. The correlations between the different tests used in this study indicate the validity and reliability of the results.

CHAPTER 3

Teachers' perspectives on learners with reading and writing difficulties in mainstream government primary schools in Mauritius

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Abstract

Background: Although Mauritius has adopted an inclusive education policy for learners with special education needs, it has not yet been implemented. Little is known about how teachers support learners experiencing reading and writing difficulties (RWD) in mainstream government primary schools.

Aim: The aim of the study was to describe the perspectives of mainstream primary school teachers in Mauritius about learners with RWD and inclusive education.

Methods: A total of 100 teachers from randomly selected schools in Zone 2, an area with urban and rural schools in Mauritius, were recruited to complete a questionnaire.

Results: The results show that almost all participants had encountered learners with RWD but they had no training in RWD or specific learning disorders. Thus, participants had inadequate perspectives about the causes, identification, and intervention of RWD. By far the majority of participants viewed special education schools as the best learning environment for learners with RWD and inclusive education as detrimental to learners with RWD. However, the same number of participants (81.8%) agreed that extensive teacher retraining will facilitate integration of learners with RWD in regular schools. Younger participants were more interested in training and more experienced teachers tended to view learners with RWD more positively.

Conclusion: The study supports the need for in-service training of mainstream primary school teachers in RWD and inclusive education, and to include the topics in the curriculum of future teachers.

Key words: Reading and writing difficulties, Perspectives, Teachers, Inclusive education, Mauritius, Mainstream government primary schools, Speech-language therapist, Special education needs

3.1 Introduction

The prevalence of learners experiencing reading and writing difficulties (RWD) has not been documented in Mauritius. Education statistics released by the government in March 2018 showed that the total number of learners attending Special Education Schools was 2656 (Education Statistics of Republic of Mauritius, 2018). Among these learners 144 (5.4%) were diagnosed with dyslexia. This number only reflects learners diagnosed with the condition and attending special education schools and does not include learners with undiagnosed RWD in mainstream government schools. Learners with RWD fail to read and write at the expected grade level and show consistent below average performance in reading and spelling (Austin & Vaughn, 2019). At present, there are no data on learners with RWD and how the education system is supporting them.

Mauritius has already adopted an inclusive education policy for learners with special education needs in 2006 (Ministry of Education and Human Resources, 2006). The policy is based on broader international guidelines such as the Salamanca Statement (UNESCO, 1994) and UNESCO (2005), but a policy framework and strategies for implementation were lacking. The Mauritian policy recognises that the concept of 'children with special education needs' extends beyond those with disabilities to include learners who fail academically due to a wide variety of reasons. Stipulations require that learners receive the best possible pedagogical services according to their specific needs, which include adaptation of the curriculum, teaching methods and organisation of the education system and/or provision of additional human and material resources to stimulate efficient and effective learning. Parity and equity of education, inclusion, and integration of all learners in the system is emphasised. A new policy framework and strategy received governmental approval in 2017 which includes several strategic goals to ensure the development of quality materials and equipment for a robust inclusive education system (Ministry of Education and Human Resources, 2017). To achieve these strategic goals, the role of teachers and their teaching approaches are important.

In an inclusive education system, the role of teachers is to adapt their teaching methods and implement specific interventions for learners with RWD extensively and creatively. There should be collaborative teamwork between teachers and professionals such as psychologists, speech-language therapists, audiologists, and occupational therapists. Teamwork allows diagnosis of learners with RWD so that their specific learning disorder can be appropriately addressed in intervention (Paterlini et al., 2019). Teachers are largely responsible to identify learners with RWD, refer them for diagnosis and collaborate with members of the multidisciplinary team to adapt the curriculum (Allen et al., 2013; Vasudevan, 2017; Vaughn & Parsons, 2013). Hence, teachers require training to familiarise themselves with the signs and causes of RWD to identify learners in their class as early as possible (Hollenweger, 2011).

It appears that teachers in mainstream schools may have insufficient knowledge of signs and causes of RWD in their learners. Studies from India, Egypt and Tanzania highlight the minimal awareness and understanding of teachers about learners who show symptoms of hyperactivity, short attention span and difficulties with literacy and numeracy-related tasks in class (Essa & El-Zeftawy, 2015; Kafonogo & Bali, 2013; Kamala & Ramganesh, 2013). Teachers may feel fearful, upset, worried, unprepared, and inadequate but may also have a sense of increased responsibility when they encounter such learners in their classes (Ateş et al., 2010). With adequate training in the inclusive education approach, teachers can have positive attitudes and be prepared to support the system and learners (Pit-ten Cate et al. 2018). The aim of this study was to describe the perspectives of mainstream primary school teachers in Mauritius about learners with RWD and inclusive education, whether there are factors associated with their views, and to what extent they are ready to support learners with RWD in a regular classroom. While the Ministry of Education in Mauritius adopted an inclusive education policy, but have not yet implemented the approach, the study may reveal caveats to address when preparing teachers for inclusive education for learners with specific learning disorders such as dyslexia which underlie their RWD.

3.2 Research methods and design

A descriptive research design using a survey questionnaire was employed. Ethical clearance from the University's Ethics Committee (HUM018/0520) and the Ministry of Education of Mauritius was obtained. The schools in Mauritius are distributed in four zones. Primary school teachers were recruited from government schools in Mauritius in Zone 2. Zone 2 has an equal number of urban and rural schools and is therefore representative of the teaching environments of teachers in Mauritius. A simple random sampling method was used to select primary schools

to participate in the study. A list of government primary schools located in Zone 2 was obtained from the Department of Primary Education. The schools were divided into urban and rural locations and allotted numbers. Using a lottery method, an even number of schools according to the urban and rural ratio was selected and requested to participate in the study. After obtaining permission for data collection from all selected schools, teachers from each school were informed about the study, approached to participate, and requested to give informed consent to complete the questionnaire. A total of 20 schools participated and four to six teachers per school agreed to participate in the study. The sample size was 100 primary school teachers. As inclusion criteria, all participants had to be qualified with at least a diploma in primary school education and should have been teaching learners in a mainstream government primary school. They should have been between 25 to 60 years of age with a minimum of three years working experience.

The sample of participants were mostly female in their later adulthood with degree qualifications and experienced in teaching. Their multilingual background reflects the prevalence of multilingualism in Mauritius and in school classrooms (see Table 3.1).

The perspectives of teachers were determined by means of a questionnaire in English, adapted from Lopes and Crenitte (2013) and Alawadh (2016). The questionnaire comprised of four sections according to topics related to the demographic characteristics of the participants, their perspectives about learners with RWD and inclusive education, and what they are doing to support such learners in mainstream government primary schools. A specific time was arranged where participants from each school completed the questionnaires individually at the same time in one room. The researcher gave basic instructions regarding the questionnaire and reminded them not to disclose their name on the questionnaire as data had to remain anonymous. The researcher was available for queries regarding the questions, but no information to influence their answers were given.

The SPSS version 16 software was used to analyse the data quantitatively in three phases, descriptive analysis, determining associations between variables and factor analysis. Descriptive statistics derived from the questionnaire responses were analysed and expressed as means, standard deviations and percentages according to the respective categories. Descriptive responses were analysed as main themes. The Chi square test was used to determine the relationships between the study variables. Data were further reduced into a small number of key dimensions (factors) using principal component analysis. This was done by determining the degree to which a certain response in the questionnaire correlated with a certain factor. By

summarising the relationships among variables in a concise way, existing relationships in the questionnaire responses could be more readily understood.

Table 3. 1 Teacher characteristics (n=100)

Demographic variable	Value	
Age (years)	Mean: 36.59 Standard deviation (SD): 7.47 Range: 22 – 59	
Gender		
Female	n = 71	71%
Male	n = 29	29%
Education		
Certificate	n = 4	4%
Diploma in Education	n = 29	29%
Degree in Education or other fields	n = 55	55%
Postgraduate degree	n = 12	12%
Teaching experience (years)		
0 – 10	n = 40	40%
11 – 30	n = 55	55%
> 31	n = 5	5%
Languages		
Home language		
Mauritian Creole	100	100%
Additional languages		
French	100	100%
English	100	100%
Hindi	24	24%
Arab, German, Mandarin, Marathi, Sanskrit, Sign language, Urdu	27	27%
Language used to teach in class		
French, English and Mauritian Creole	64	64%
French and English only	25	25%
Creole and French only	1	1%
Creole and English only	1	1%
Creole only	1	1%
French only	2	2%
English only	7	7%
Subjects taught		
General subjects	97	97%
Non-academic subjects	3	3%
Number of learners in class		
15 – 24	6	26%
25 – 34	50	50%
35 and above	24	24%

3.3 Results

The quantitative data are presented in percentages and standard deviations to show the participants' perspectives about the causes, symptoms, and the involvement of a multidisciplinary team in learners with RWD. Participants' own descriptive responses of strategies to assist learners with RWD in regular classrooms are presented as main themes and percentages. Significant associations between variables were considered on $p<0,05$ and the factor analysis results are presented as Eigen values.

Participants' teacher training about RWD, their familiarity with diagnostic terms, causes of RWD and the multidisciplinary team involved in the intervention for learners with RWD.

The results showed that only 51% of participants had an orientation about different communication disorders and specific learning disorders during their teacher training. By far the majority (78%) did not receive any information about the roles of audiologists and speech-language therapists in schools. The diagnostic terms related to RWD they were familiar with varied. Participants were mostly familiar with dyslexia (87%), and attention deficit hyperactivity disorder (57%). They were less familiar with terms such as phonological disorder (41%), specific learning disorder (40%), dyscalculia (38%), dysgraphia (33%), and central auditory processing disorder (20%).

According to most participants, the reason for RWD were due to intellectual disability (82%), and a lack of parental involvement and limited interest in their child (79%). Seventy percent indicated that RWD may be due to behavioral problems such as attention deficit and 69% noted that it might be secondary to sensory deficits such as hearing difficulties and poor vision. Only 43% of teachers indicated that teaching methods contributed to RWD. Most participants (70.7%) responded that RWD or specific learning disorder can be outgrown, showing that they may not fully understand the underlying nature of difficulties with reading and writing.

Participants were also asked which professionals they would consult when they suspected that a learner had RWD. Most participants (65%) said they will refer the learner to the school principal and only 29% would ask for the assistance of a support teacher. Their answer may be related to the limited availability of support teachers in mainstream schools in Mauritius. Very few participants selected professionals involved in the diagnosis and intervention of RWD, such as psychologists (26%), speech-language therapists (8%) and occupational therapists (6%). However, 96% of participants reported to have encountered learners with RWD in their teaching career.

Perspectives on identification and support of learners with RWD

To facilitate the presentation of the findings and shown in Table 2, the responses on the 4-point Likert scale were reduced to two categories only, 'strongly agreed/agreed' and 'disagreed'/'strongly disagreed'. Most participants (64.3%) were confident that they would be able to identify learners with RWD, but more (67.7%) reported that they do not have sufficient knowledge to support them. A positive result is shown as 77.7% of participants believed that a learner with RWD or a specific learning disorder can be identified before the child is eight years old (see Table 3.2).

Table 3. 2 Participants' perspectives on their ability to identify and support learners with RWD

Statements	Agreed/Strongly Agreed %	Disagreed/Strongly Disagreed %	SD
I have enough knowledge about RWD to be able to identify such learners.	64.3	35.7	5.1
I have enough knowledge about RWD to be able to support such learners.	32.3	67.7	16.2
RWD cannot be identified until a learner is 8 years old.	22.3	77.7	22.2
The future for literacy achievement for learners with RWD is extremely limited.	60.6	39.4	2.1

Perspectives on characteristics of learners with RWD

As shown in Table 3.3 most participants regarded learners with RWD as being good at art, music and other extracurricular activities (76.7%) and that they are more creative (65.7%). A total of 59.6% strongly agreed/agreed that learners with RWD often try harder to read and can complete their class/homework (70.7%) on their own. Participants therefore had a fair perspective about those characteristics of learners with RWD that could facilitate their inclusion in regular schools. Most participants strongly disagreed/disagreed (69.7%) with the statement that learners with RWD are likely to demonstrate behaviour problems in regular classrooms. The majority (60.6%) believed that the future literacy achievements for learners with RWD are extremely limited.

Table 3. 3 Participants' perspectives about characteristics of learners with RWD

Statements	Agreed/Strongly Agreed %	Disagreed/Strongly Disagreed %	SD
Learners with RWD are good at art, music, drama, sports, design.	76.7	23.3	1.0
Learners with RWD are more creative than other learners which allow them to overcome their difficulties.	65.7	34.3	1.0
Learners with RWD tries harder than other learners to read.	59.6	40.4	3.0
It is likely that learners with RWD will show behaviour problems in regular classrooms.	30.3	69.7	9.1
Most learners with RWD try to complete their classwork and homework.	70.7	29.3	0.0

Perspectives on learners with RWD in inclusive education

By far the majority of participants (81.8%) were of the opinion that learners with RWD should be enrolled in a special education needs school rather than in a mainstream school within an inclusive education approach. As shown in Table 3.4 there was little variation in views that inclusive education may be detrimental for typical learners (63.7%, 61.6% and 65.6%). The majority (63.7%) responded that a regular classroom will not promote the academic growth of learners with RWD. Almost the same number of participants (61.6%) strongly agreed/agreed that the behaviour of learners with RWD may set a bad example for typically achieving learners and that the extra attention given to learners with RWD will be to the detriment of other learners. According to 65.6% of the participants, it will also be challenging to justify to typically achieving learners the modification of coursework for learners with RWD.

As further shown in Table 3.4 participants were almost evenly divided in responses that learners with RWD in inclusive classrooms may foster better understanding and acceptance of differences among learners, and that learners with RWD are socially isolated in the regular classroom. The result may show that participants were uncertain about the advantages of inclusive education for learners with RWD. A higher percentage (68.4%) of participants expressed their willingness to welcome learners with RWD in their classroom. This is an interesting result as only 18.2% expressed the view earlier that learners with RWD should not be enrolled in special education schools. This may reflect a positive attitude towards learners

with RWD. A strong recognition of training needs may be seen in the following result (Table 4). By far the majority of participants (81.8%) strongly agreed/agreed with the statement that integration of learners with RWD will require extensive retraining of regular classroom teachers.

Table 3. 4 Participants' perspectives learners with RWD in inclusive education

Statements	Agreed/Strongly Agreed %	Disagreed/Strongly Disagreed %	SD
Learners with RWD should be enrolled and followed up in appropriate special educational needs schools.	81.8	18.2	5.1
Integration of learners with RWD offers mixed group interaction that will foster understanding and acceptance of differences among learners.	53.6	46.4	4.0
Being in regular classrooms will promote the academic growth of learners with RWD.	36.3	63.7	8.1
The behaviour of learners with RWD will set a bad example for learners without difficulties.	38.4	61.6	15.2
Integration of learners with RWD will require extensive retraining of regular classroom teachers.	81.8	18.2	1.0
The extra attention learners with RWD will be to the detriment of the other learners.	74.7	25.3	2.0
Learners with RWD are socially isolated in the regular classroom.	48.5	51.5	3.0
I would welcome learners with RWD in my classroom and would work with them.	68.4	31.6	6.3
Modification of coursework for learners with RWD would be difficult to justify to other learners.	65.6	34.4	2.1

Participants' strategies to assist learners with RWD in regular classrooms

Participants were also asked to describe strategies that they would employ to support learners with RWD (see Table 3.5). Most participants (92%) responded to this open-ended question. Responses could be divided into two categories. The majority (64.1%) of the descriptions involved assistance to learners with RWD outside the regular classroom, with active engagement with a multidisciplinary team of specialists such as psychologists, speech-language therapists and occupational therapists. Far less (35.86%) responses included strategies that participants would employ within their classrooms. The limited number of within-classroom strategies mentioned by participants may be related to their views in Table 3.4 that learners with RWD should be enrolled in special education schools.

Table 3. 5 Strategies suggested by participants to assist learners with RWD

Strategies involving assistance from outside the regular classroom	**n**	**%**
1. Special education with specialized educators (individual attention)	21	14.5
2. De-loading the curriculum (e.g. language exemptions)	17	11.7
3. Regular visits of psychologists and other therapists	11	7.6
4. Use of adapted books and resources	10	6.9
5. Support teachers	9	6.2
6. Categorizing learners based on their abilities and difficulties to be able to focus on essential learning competencies	9	6.2
7. Decrease student-teacher ratio	6	4.1
8. Training of normal curriculum educators to identify these learners	5	3.5
9. Remedial work	4	2.8
Strategies to use within their classrooms	**n**	**%**
1. Use of teaching aids	12	8.3
2. Use of multisensory teaching modalities	9	6.2
3. Activity-based lessons	9	6.2
4. Peer teaching, mixed ability classrooms	6	4.1
5. Repetition exercises	6	4.1
6. Phonological activities (phonics)	5	3.5
7. Vocabulary building exercises	3	2.1
8. Motivate them	2	1.4

It is, however, interesting to observe that participants are resourceful about strategies to be used in their classroom to assist learners with RWD, even though some only had an orientation about

communication disorders and specific learning disorders during their teacher training. Some participants also suggested strategies that are in accordance with the principles of inclusive education, such as peer teaching and mixed ability classrooms. However, most responses (14.5%) again point to a special education perspective and not to inclusive education (see Table 5).

Significant associations between participants' age intervals, qualifications and years of experience, and the way they responded to questions

Using the Chi-square test, further analyses were performed to determine if there were any statistically significant associations between participants' perspectives expressed in the questionnaire and their age, qualifications, and years of experience. Results indicated that there was a significant association ($p<0.05$) between the participants' age and agreement or disagreement with the statement "Integration of learners with RWD will necessitate extensive retraining of regular classroom teachers". A total of 44.8% participants within the age range of 20 to 30 years strongly agreed and 61.5% of participants between 31 to 40 years old agreed to additional training. It therefore appears that younger participants were more likely to agree to training to support learners with RWD in an inclusive education system.

A significant association was also found between age and the statement related to the future literacy achievements for learners with RWD. A total of 32.6% participants 31 to 40 years old and 30.2% of participants 41 to 60 years old agreed that literacy achievements for learners with RWD are limited. It therefore appears that older participants had a more negative perspective on the ability of learners with RWD to achieve literacy. Another significant association ($p< 0.05$) was found for the statement "most learners with RWD try to complete their classwork and homework" and participants' qualification level. A total of 65.7% participants with a lower qualification (diploma in teaching on a primary level) disagreed that learners with RWD try to complete their classwork and homework.

Further analysis revealed significant associations ($p<0.005$) between the statements "Learners with RWD are good at arts, music, drama, sports and design", "Integration of learners with RWD will necessitate extensive retraining of regular classroom teachers", "I would welcome learners with RWD in my class and would work with them" and participants' years of teaching experience. Forty two percent to 44% of participants with 11 to 30 years of experience in teaching agreed to these statements. It appears that more experienced teachers tended to view learners with RWD in an inclusive classroom more positively and agreed that teachers needed extensive training.

Significant associations between participants' perspectives about identification and intervention of RWD and their views on learners with RWD in an inclusive classroom.

The Chi-square test was further used to investigate the associations between the participants' responses about the identification and intervention for learners with RWD and their perspectives on learners with RWD in their classrooms. The results revealed significant associations ($p<0.05$) between the participants' confidence about identification of learners with RWD and their agreement to statements that emphasised characteristics about learners with RWD that may facilitate their inclusion (see Table 3). Participants who were more confident about their ability to identify learners with RWD tended to view learners with RWD more positively, agreeing that they can achieve in certain areas. Statements included whether learners with RWD are generally good at non-academic subjects ($p=0.006$) and will benefit from an inclusive education approach as it will foster an understanding of their difficulties and promote their social acceptance ($p=0.04$) and the view that an inclusive classroom will promote the academic progress of learners with RWD ($p=0.004$). Participants who were most confident that they could identify learners with RWD also agreed that learners with RWD make extra efforts to meet academic demands ($p=0.04$), although isolation in class is anticipated in a regular classroom ($p=0.04$).

There were also significant relationships ($p<0.05$) between participants who stated they lacked knowledge about intervention of learners with RWD and their perspectives on efforts of learners with RWD when included in an inclusive classroom. Those participants were more likely to agree that learners with RWD try to complete their classwork and homework ($p =0.04$), but that extra attention given to learners with RWD will be detrimental to typical learners ($p= 0.00$). More importantly, participants who stated that they do not know enough about RWD intervention, reported that they would welcome learners with RWD in their class and work with them ($p=0.01$). The same participants were also more likely to agree that retraining of all regular classroom teachers is required to successfully integrate learners with RWD ($p= 0.01$).

Factor analysis of statements and responses about identification and intervention of RWD and views on learners with RWD in an inclusive classroom

Factor analysis is a technique used to summarise many variables into fewer factors. This technique extracts maximum common variance from all variables and puts them into a common score. Thus, the set of possible correlated variables was converted into a reduced set of uncorrelated variables that capture most of the variation in the original data. In addition to the descriptive analysis conducted as shown in Tables 3.2, 3.3 and 3.4, and chi-square tests carried

out to investigate the associations, factor analysis was used as a reduction method to extract commonalities from statements in Tables 3.2, 3.3 and 3.4.

Table 3. 6 Component Score Coefficient Matrix for participants' perspectives about identification and intervention of RWD

Statements	Component Score Coefficient Matrix	
	Component 1: Perspectives about identification and intervention of RWD	**Component 2:** Misconceptions about RWD
	Eigen values	
Participants had enough knowledge about RWD to be able to identify such learners.	0.433*	0.106
Participants had enough knowledge about RWD to be able to support such learners.	0.488*	0.038
Participants believed RWD cannot be identified until a learner is 8 years old.	0.358	0.477*
Participants believed that the future for literacy achievement for learners with RWD is extremely limited.	0.127	0.843*

* Items with highest eigen values considered to describe the component

The factor analysis carried out for statements pertaining to participants' perspectives about identification and intervention of RWD (Table 3.2) identified two components (factors) as shown in Table 3.6. Component 1 was made up of variables regarding the participants' perspectives about the identification and intervention of learners with RWD. In that respect, Component 1 was described as 'Perspectives about identification and intervention of RWD'. While Component 2 relates to variables that represented misconceptions about RWD, such as 'RWD cannot be identified until 8 years of age', and 'Learners with RWD have poor literacy achievements.' Perspectives about identification and intervention of RWD was found to be more important than the misconceptions about RWD. The component consists of significant information about the participants' confidence about how they currently identify and support learners with RWD.

Table 3. 7 Component Score Coefficient Matrix for participants' perspectives about characteristics and their views on learners with RWD in an inclusive classroom

Statements	Component Score Coefficient Matrix					
	C 1	C2	C3	C4	C5	C6
	In favour of inclusive education	Integration in inclusive education is subject to the training of teachers	Behaviour problems and other issues	Characteristics that can facilitate inclusion in a regular class	Try to read	Try to mee the classroom academic demands
	Eigen values					
Learners with RWD are good at art, music, drama, sports, design.	0.368	0.153	0.029	0.694*****	0.327	0.049
Learners with RWD are more creative than other learners which allow them to overcome their difficulties.	0.426	0.405	0.213	0.482*	0.419	0.160
Learners with RWD tries harder than other learners to read.	0.364	0.419	0.112	0.269	0.088	0.542*
Most learners with RWD try to complete their classwork and homework.	0.201	0.472	0.072	0.166	0.452*	-0.456
It is likely that learners with RWD will show behaviour problems in regular classrooms.	0.283	0.121	0.603*	0.188	0.241	0.048
Integration of learners with RWD offers mixed group interaction that will foster understanding and acceptance of differences among learners.	0.713*****	0.133	0.439	0.065	0.263	0.230

	Eigen values					
Being in regular classrooms will promote the academic growth of learners with RWD.	0.611*	0.147	0.522	0.017	0.094	0.268
The behaviour of learners with RWD will set a bad example for learners without difficulties.	0.414	0.484	0.104	0.058	0.358	0.418
Integration of learners with RWD will require extensive retraining of regular classroom teachers.	0.361	0.520*	0.365	0.260	0.323	0.165
The extra attention learners with RWD will be to the detriment of the other learners.	0.481	0.342	0.200	0.005	0.283	0.004
Learners with RWD are socially isolated in the regular classroom.	0.255	0.327	0.409	0.387	0.309	0.333
I would welcome learners with RWD in my classroom and would work with them.	0.183	0.583*	0.027	0.357	0.286	0.260
Modification of coursework for learners with RWD would be difficult to justify to other learners.	0.277	0.087	0.523*	0.280	0.279	0.178

Furthermore, the principle component analysis enabled the extraction of six components from statements related to participants' perspectives about characteristics and their views on learners with RWD in an inclusive classroom (Table 3.3 and 3.4). Only those components with higher loadings (eigen values) were included. As shown in Table 3.7, Component 1 identifies variables which were described as in favour of inclusive education for learners with RWD. Component 2 included variables that showed that the participants agree to the integration of learners with RWD in inclusive education but also highlights the need for training of mainstream primary school teachers. Component 2 was described as integration in inclusive education which is subject to the training of teachers. Component 3 consisted of variables regarding behavioural problems and drawbacks of teaching learners with RWD in a regular

classroom that the participants anticipated (described as Behaviour problems and other issues). Component 4 incorporated all the characteristics about learners with RWD that can facilitate their inclusion in a regular classroom, such as being more creative and that they are good at non-academic subjects or activities. Component 4 relates to the characteristics of learners with RWD that can facilitate inclusion in a regular classroom.

Lastly, Components 5 and 6 are variables that show the attempts of learners with RWD to read and write in class. Component 5 could be described as 'Learners with RWD try to read' and Component 6 as 'learners with RWD try meet the classroom academic demands. Components 1, 2 and 3 consisting of variables which were generally in favour of inclusive education for learners with RWD and highlighted the need for training of mainstream primary school teachers, were found to be most important in this analysis. This shows that learners with RWD can be taught adequately in regular classrooms if the education system and teachers are appropriately equipped with resources along with professional development training. Also, learners with RWD have characteristics other than difficulties to read and write that can not only facilitate their integration among typically achieving learners but also may contribute to the overall learning process of all learners in the class.

3.4 Discussion

The participants' familiarity with RWD, their perspectives on its causes, identification and intervention options in an inclusive education setting are discussed in relation to the training they received, similar research studies and within an inclusive education framework. Associations found between the participants' age, qualification and years of experience are also critically discussed and compared to their overall perspectives on learners with RWD and findings in literature.

Mauritius is progressing towards implementing an inclusive education approach for all learners with special education needs which includes those experiencing difficulties with reading and writing skills in regular classrooms. At the primary education level, teachers play a vital role in early identification of learners with any form of RWD so that they may be able to achieve with appropriate support in an inclusive classroom (Essa & El-Zeftawy 2015; Gandhimathi, 2010). To better support learners with RWD, teachers must be equipped with adequate knowledge about identification and intervention of learners with RWD in an inclusive education setting (Shukla & Agrawal, 2015). The current study revealed the detailed perspectives of a sample of mainstream primary school teachers in Mauritius on their training

and experiences of learners with RWD, their views on inclusive education and self-reported strategies they would use to support learners. Significant associations were found between certain participant demographics and views expressed in the survey questionnaire. Additional associations were found between those participants who reported they were confident to identify learners with RWD and those who stated that they lacked knowledge to intervene with learners with RWD in the classroom, and views on learners with RWD in their classrooms. Factor analysis highlighted the importance given to certain statements as they were summarised under specific factors.

The demographic characteristics of the 100 participants showed they were mostly female with a mean age of almost 37 years, mostly well qualified with bachelor or higher degrees, and teaching experience of more than 10 years. Even though they are accomplished teachers, and almost all had encountered learners with RWD, participants had no training about the role of speech-language therapists and audiologists in schools except for an orientation on communication disorders and RWD. Almost all participants had encountered learners with RWD in their teaching. The results are consistent with that of Gündoğmuş (2018) and Dapudong (2014) who also found that mainstream primary school teachers working in an inclusive education system in Turkey and Thailand had not received any orientation or training in special education.

The participants' lack of training was further reflected in their limited views on the wide variety of causes of RWD and diagnostic terms related to underlying causes. They rated intellectual disability and lack of parental involvement in their child's education as main contributing factors for RWD. In similar studies, teachers reported that family variables were among the causes of RWD, thereby assigning the family with the greatest share of responsibility in assisting learners with RWD (Gündoğmuş 2018). However, participants were less familiar with conditions like specific learning disorders, auditory processing difficulties, and attention deficit hyperactivity disorder which largely contribute to RWD and the need for specific interventions (American Psychiatric Association, 2013; Fienup et al., 2015; Küçükünal, Özçelik & Yalçınkaya, 2020). Being knowledgeable about all possible underlying causes of RWD is important for teachers so that they can identify their learners' difficulties, detect the degree of severity and develop intervention strategies in the educational context for these learners (Gonçalves & Crenitte, 2014; Henrique & Madeira, 2017). Several authors point out that a lack of training related to RWD may jeopardise early identification and subsequent interventions of learners with RWD in an inclusive education setting (Alnaim, 2015; Essa & El-Zeftawy, 2015;

Saravanabavan & Saravanabavan, 2010). Once a learner is identified with RWD, it is important that the teacher engages in an appropriate intervention by following the correct referral course to other professionals.

In the current study, the majority of participants reported that they do not have sufficient knowledge about intervention of learners with RWD to support them. Participants were also not familiar with the multidisciplinary team involved in the assessment, diagnosis and intervention of learners with RWD. Research supports the need for referral to qualified professionals for evidence-based evaluations and intervention which are necessary for achieving optimal outcomes for learners with RWD (Kathard et al., 2011; Wium & Louw, 2013). Participants' lack of experience with the multidisciplinary team is to be expected as they received no training regarding intervention of RWD and there is also a shortage of these professionals in Mauritius. The results clearly emphasize the need to train teachers about the functions of the multidisciplinary team around the learner with RWD and their own role in the collaboration (Mitchell, 2015; Nascimento et al., 2018). The aim of the inclusive education approach is to include these learners within the educational system and provide them with the necessary support to enter and remain within the system (Mitchell, 2015). This can only be done through the implementation of several learning strategies to fulfill the needs of the diversity of learners (Mosquera et al., 2018). The use of adapted books, curriculum and assessment tools are important strategies for learners with RWD (Kafongo & Balli, 2013). Inclusive education practice involving inter- and intra-professional collaboration with educational psychologists and other therapists within school practice is considered as an integral part of the intervention for learners with RWD (Lütje-Klose & Urban, 2014). With appropriate therapeutic intervention and teaching methods, many learners with RWD can develop literacy skills and meet academic demands (Gillon et al., 2019).

Most participants identified certain characteristics about learners with RWD which may facilitate their inclusion in regular classrooms. According to Gindrich and Kazanowski (2017) learners with RWD may be more creative at art, music and other extracurricular activities even if they have significant difficulties mastering reading and writing skills. Similar to Lopes and Crenitte (2013), participants observed that learners with RWD often try harder to read and to complete their class/homework on their own. However, participants anticipated that learners with RWD may display behaviour problems in regular classrooms (Cavioni et al., 2017). Typically achieving learners may act as role models for those with RWD, thereby promoting understanding and acceptance of different learners (Hayes & Bulat, 2017). The participants'

recognition of favourable characteristics of learners with RWD is a starting point for training. It may help teachers and typically achieving learners to develop a more balanced view of learners with RWD in their class, thereby facilitating the integration of learners with RWD. Similar to the findings of Cretu and Morandau (2020), the current study also found that younger participants were more interested in training to support learners with RWD in an inclusive education system. Furthermore, experienced teachers among the participants tended to view learners with RWD more positively and agreed that they needed extensive training.

In contrast, most of the participant responses indicated that learners with RWD should be in a special education needs school as their academic growth will be restricted in a regular classroom. Participants also viewed inclusive education as detrimental to learners with RWD. Only 18.2% of participants expressed a view to support inclusive education. The most common explanation for this point of view in other studies is the large teacher-student ratio in regular classrooms, the lack of time to give special attention to learners with RWD or to adapt teaching tools (Florian, 2012). In the current study, 74% of participants were teaching large numbers of 25 to 34 and more learners (see Table 3.1). However, similar to other studies, the current participants tended to agree that an inclusive education setting may foster a better understanding and acceptance of differences among learners as social isolation may be eliminated (Beacham & Rouse, 2012; Costello & Boyle, 2013; Lüke & Grosche, 2018). Even though a clear preference for special education was expressed, the majority of participants were willing to accommodate learners with RWD in their classrooms provided that they receive extensive retraining to support these learners to achieve literacy goals. The views of participants regarding inclusive education are in agreement with studies that show teachers felt less able to meet the needs of learners with RWD and that they had insufficient knowledge to teach them (Alamadhi & Keshky, 2019; Gonzalves & Crenitte, 2014; Lingeshwaran, 2013). Factor analysis showed that the most important components for the study were that participants indicated that learners with RWD may be included in regular classrooms when teachers are adequately trained in inclusive education. This perspective indicates that teacher training in inclusive education principles and strategies may be favourably received.

When participants described support strategies that may assist learners with RWD in a regular classroom, their responses showed how resourceful they were despite no training. However, strategies that could be employed within the classroom were limited. Participants focused more on increasing the learners' reading and writing outcomes by using one-on-one instruction

which may not be the best approach according to various studies (Amendum et al., 2011; Vernon-Feagans et al., 2013).

Some limitations and strengths of the present study can be addressed. The survey questionnaire used in the study could have included more questions about inclusive education for learners with RWD. However, when used in future research the same questionnaire may indicate changes in perspectives of mainstream primary school teachers after training sessions and implementation of inclusive education for learners with RWD in Mauritius. The principle component analysis highlighted the importance that we have lend to certain statements as they were summarised under specific factors.

3.5 Conclusion

It would be justified to say that the perspectives of regular classroom teachers towards educational inclusion are key to include learners with RWD in regular schools (Pit-ten Cate et al., 2018; Joshi et al., 2016). The results of the current study should be viewed against the background of participants who are well qualified as teachers but with no training in inclusive education or how to assist learners with RWD in a regular classroom. It is therefore no surprise that they consider special education schools as the best learning environment for learners with RWD instead of regular classrooms. Training will increase teachers' confidence in their identification and teaching practices, thereby encouraging them to create more engaging learning environments for learners with RWD (Bell et al., 2011; Gwernan-Jones & Burden, 2010; Washburn et al., 2017). The study supports the need for in-service training of mainstream primary school teachers in RWD and inclusive education, and to include the topics in the curriculum of future teachers in Mauritius. Such training may be favourably viewed by teachers. More research should be conducted to investigate the perspectives of school principals, support teachers and the multidisciplinary team on learners with RWD in mainstream schools as they are important sources of information. This will provide a wide range of perspectives to policy makers to improve education and support for learners with RWD and to accelerate the implementation of inclusive education in Mauritius.

CHAPTER 4

Parental perspectives on their Grade 4 children with reading and writing difficulties in mainstream government schools in Mauritius

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Abstract

Reading and writing difficulties (RWD) in learners pose significant challenges not just for children but also for parents. While there is limited support available for children with RWD and their parents in Mauritian schools, research may reveal areas of parental need that may be addressed by speech-language therapists. The aim was to determine parents' perspectives regarding their Grade 4 children with RWD in mainstream government schools in Mauritius. Children with RWD were identified by teachers with the Screening Tool for Learning Disorder and parents were requested to participate in the study. Sixty-seven parents completed a questionnaire, investigating their perspectives on the symptoms and causes of their child's RWD and the ways in which they assist their child. The screening tool differentiated between children at risk of specific learning disorder (SLD) and children who indicated clear symptoms of SLD. The results of the tool did not correspond closely with the participants' satisfaction with their child's academic performance. Majority of participants could, however, identify RWD in their children when descriptions were given. Parents mostly cited laziness as the main cause for their child's RWD. The results showed participants had limited information about causes and symptoms of RWD and SLD. There is a lack of awareness about the role of speech-language therapists in the intervention of RWD. There are limited resources and support for children with RWD, despite an inclusive education policy in Mauritius. Speech-language

therapists and teachers should collaborate to support learners with RWD and their parents using inclusive education strategies.

Keywords: Mainstream government schools; Mauritius; parental perspectives; reading and writing difficulties; speech-language therapists; specific learning disorder

4.1 Introduction

Raising a child with the aim of making them independent is considered the primary responsibility of any parent. Education and acquiring the ability to read and write are integral parts of being independent (Machel, 2017). It is also well established that there is a positive correlation between reading proficiency and a child's academic success (Schwabe et al., 2015). Learners with reading and writing difficulties (RWD) lag behind their peers in academic achievement and meeting classroom demands, while difficulties create a gap between the learner's true potential, day-to-day productivity and performance at school (Johney et al., 2015). RWD in learners are characterized by several causes and underlying conditions (Henrique & Madeira, 2017).

Studies have shown that approximately 7% of learners have significant and severe reading difficulties for reasons beyond poor teaching (Haft et al., 2016). There are numerous factors contributing to the reading and writing skills of learners, described by Henrique and Madeira (2017) as extrinsic and intrinsic elements. Extrinsic elements include socio-familial, pedagogic, and socio-cultural factors, while intrinsic components involve psychological and biological factors within the child. Language exposure at home is an extrinsic factor related to the child's socio-familial and socio-cultural background (Marjanovič-Umek et al., 2015; Nag et al., 2019). If the child is not given the opportunity to use materials that are associated with the language of learning and teaching in school, reading ability may be delayed (Hemmerechts et al., 2017). Other notable intrinsic causes of RWD are the presence of any restricted intellectual capacity, speech-language, hearing, and visual impairments, attention deficit and hyperactivity, and behavioural concerns which may impede the way learners read letters, words, and sentences, and understand and retell the content of reading (Axelsson et al., 2020; Kodiango & Syomwene, 2016). Further intrinsic elements like genetic factors may also play a role as numerous studies indicate that a parental history of reading difficulties already impact their children's emergent literacy performance. Children with a positive parental history of RWD show significantly poorer emergent literacy skills and poorer performance at school in

comparison to those whose parents do not exhibit any RWD (Esmaeeli et al., 2017; Snowling & Melby-Lervåg, 2016).

Learners with RWD may have deficits in phonological awareness, resulting in persistent difficulties with accurate and/or fluent word recognition, decoding and spelling, despite adequate cognitive abilities and classroom instructions (Kuerten et al., 2019; Hebert et al., 2018). Schools may often designate learners with RWD as 'unintelligent' or 'lazy' until they are diagnosed (Thompson et al., 2015), thereby denying support to meet the demands of the curriculum (Pit-ten Cate, 2018). In such circumstances, parents of children experiencing RWD may feel unsupported, because the poor academic performance of their child portrays a doubtful future (Karande & Kuril, 2011; Chandramuki et al., 2012). Parents with a child with RWD may display negative attitudes towards the problem, which may include denial, rejection, and self-blame (Findler et al., 2016). Consequently, they fail to realise that there is a need for immediate action and attribute the problem to the child's behaviour or a developmental process that will resolve (Sahu et al., 2018). Most parents might not know how to assist their child in developing their reading and writing skills, thereby negatively impacting both parents and child (Delany, 2017). Furthermore, the inability to assist and understand their child with RWD may be due to a lack of knowledge about the nature and signs of RWD, or specific learning disorder (SLD) when diagnosed (Johney et al., 2015). In a study by Zivoder et al. (2017), only 39% of the participating parents were partially acquainted with SLD, while 48.2% were familiar with the symptoms.

As such, it is important to consider parents as the primary facilitators for reading and writing readiness. Encouraging and stimulating their child's age-appropriate oral language development and vocabulary, appreciating stories and books, acquiring phonological awareness, understanding basic print concepts and the alphabetic principle, learning to distinguish shapes, and identifying at least some letters of the alphabet, have been proven to result in better emergent literacy skills and promote reading and writing at school (Manten et al., 2020; Mohammed & Amponsah, 2018). Parental involvement in their child's academic work is a powerful correlate of scholastic achievement (Hemmerechts et al., 2017), resulting in fewer behavioural problems in school and less grade retention, whereas minimal parental involvement shows poorer achievement outcomes in children (Ross, 2016). Frequent communication with teachers and cultivating the child's interest in learning habits through interactive participation and behavioural support for their child, affect academic achievement positively (Darling-Hammond et al., 2020). Parental participation can likewise compensate for

lower intelligence, prevent adverse effects of low socio-economic status and encourage scholastic achievement (Li & Qiu, 2018).

Speech-language therapists in Mauritius anecdotally report that parents appear to be unaware of the possibility that their child may be experiencing RWD because of SLD, and not necessarily due to lower intelligence or poor teaching methods in school. This tendency may be due to the limited resources available to primary school teachers in mainstream government schools in Mauritius (Veerabudren et al., 2021). Another contributing factor could be the use of the pull-out model of intervention in Mauritian schools, where individual learners receive intervention outside the classroom, which limits opportunities to adjust the curriculum for learners with RWD and restricts parental involvement (Fernandez & Hynes, 2016).

With parental involvement judged as essential, investigating the perspectives of parents in Mauritius regarding their child's RWD may show areas of need that may be addressed in households with the assistance of speech-language therapists. Hence, the aim of the study was to determine parents' perspectives regarding their Grade 4 children with RWD in mainstream government primary schools in Mauritius. Grade 4 learners (eight to nine years of age) were found to be the most appropriate population to investigate in the study Learners typically become sophisticated readers by nine years of age, showing independent reading and writing at sentence level to meet academic demands (Horowitz-Kraus et al., 2017). The investigation may delineate extrinsic and intrinsic factors that facilitate or pose barriers to the development of reading and writing skills for children in the Mauritian context.

4.2 Method

A descriptive research design using a parent-completed survey questionnaire was employed. Ethical clearance from the Ethics Committee (HUM018/0520) of the University of Pretoria, South Africa and the Ministry of Education of Mauritius, was obtained. Permissions to identify children with RWD in Grade 4 classes were obtained from 20 randomly selected mainstream government primary schools in educational Zone 2 in Mauritius. The zone has a near equal distribution of urban and rural schools.

To gain access to parents as participants, learners with RWD in Grade 4 were identified after being screened with the help of their class teachers, using a purposive sampling method. The Screening Tool for Learning Disorder, developed and validated by Vidyadharan et al. (2017), was used. The screening tool contains 26 items from the domains of reading, writing, spelling, and mathematics. According to the tool, a score of 11 to 20 indicates a need for an assessment

to confirm a SLD and a score of >20 signals SLD. Inclusion criteria for parents as participants were based on the characteristics of their child. The children should have been in Grade 4, aged between eight and nine years old, and attending a government primary school at the time of data collection. The children should also have scored 11 or higher on the screening tool to be identified with RWD.

RWD, therefore, refers to persistent academic learning difficulties in terms of reading accuracy, reading comprehension, and spelling difficulties across the different languages (English and French), which are both used as mediums of instruction in Mauritius. However, participants' children did not necessarily undergo any diagnostic procedures, and the possible causes for RWD are unknown, except for the presence of a hearing difficulty which was ruled out by a hearing screening test. A validated hearing screen by Mahomed-Asmail et al. (2016) was used.

As shown in Table 4.1, a total of 67 parents and legal guardians (n=39, 58.2% mothers) participated in the study. The largest age group in the sample was between 31 and 40 years old (n=32, 47.8%), and almost all agreed that they are involved in their child's education by helping them with homework and revisions (n=65, 97.0%). Notably, most participants had male children with RWD (n=42, 62.7%) and had more than one child in their family (n=56, 83.6%). It is well-known that children with RWD show a male bias of approximately 2:1 and 3:1, which corresponds with the male bias in this study sample (American Psychiatric Association [APA], 2013). By far, the majority of participants (n=50, 74.6%) completed 11 years of school. Most participants (n=61, 91.0%) use Mauritian Creole as their primary language at home, which is in contrast with English as the main language of learning and teaching. Very few participants reported the presence of any psychiatric illness or conditions such as autism spectrum disorder (ASD), intellectual developmental disability (IDD), or SLD in their family (n=8, 11.9%).

Table 4. 1 Participant characteristics (n=67)

Demographic variable	Frequency	Percentage
	n	%
Participants who completed the questionnaire		
Mothers	39	58.2
Fathers	21	31.3
Legal guardians	7	10.4
Age (years)		
20-30	23	34.3
31-40	32	47.8
41-50	12	17.9
Gender of Grade 4 child		
Female	25	37.3
Male	42	62.7
Region		
Urban	30	44.8
Rural	37	55.2
Highest education qualification of participant		
Cambridge school certificate (11 years of school completed)	50	74.6
Higher school certificate (13 years of school completed)	4	6.0
Graduate degree	13	19.4
Number of children in the family		
1	11	16.4
2	28	41.8
≥ 3	28	41.8
Language spoken at home		
Mauritian Creole	61	91.0
French	6	6.0
Presence of psychiatric illness, IDD, ASD, and SLD in the family	8	11.9
Participates in their child's education	65	97.0

During a literature search, no published questionnaire could be found that meets the requirements of the study. Thus, a questionnaire was compiled in English as parents in Mauritius are expected to be able to read and understand English since their minimum

qualification was a Cambridge school certificate (11 years of school completed, Table 1). Questions in the questionnaire have been used in studies by Zivoder et al. (2017) and Johney et al. (2015). The questionnaire comprises of questions related to the following areas of interest: (1) Demographic details of parents having a child with RWD; (2) Medical and developmental history of their child with RWD, (3) Parental descriptions about the symptoms and causes of their child's RWD; and lastly; (4) Ways in which they assist their child with RWD. Multiple choice questions closed-ended (Yes/No) and open-ended questions were included.

Data collection was conducted during the last term of the 2020 school year, when the parents had already received at least two school reports of the academic performance of their children. After obtaining informed consent from parent participants, a meeting was arranged at their convenience at their child's school. Participants were given basic instructions regarding the questionnaire. While participants completed the questionnaire, the first author also read out the questions in case they had difficulty doing so. Participants were not assisted in completing the questionnaires, but the first author was available for queries regarding the questions. To comply with research ethics all participants' children were brought under the attention of their schools and the two speech-language therapists employed by the Ministry of Education for follow-up.

Quantitative data from the questionnaires were analysed using the SPSS version 26 software and firstly interpreted as frequencies and percentages. The continuous variables were tested for normality using the Kolmogorov-Smirnov. If the p-value was greater than 0.05, the data was normally distributed, and parametric tests were used. On the other hand, if the p-value was less than 0.05, the data differ from normality, and nonparametric tests were used. Since the p-value was greater than 0.05 ($p=0.059$), we assumed normality and the parametric independent samples t-test was used to determine significant differences between independent groups for the continuous variable (score on the Screening Tool for Learning Disorder). The null hypothesis of the t-test stated that the differences were not statistically significant, whereas the alternative hypothesis stated that it was. If the p-value was less than 0.05, the null hypothesis was rejected, and the differences in scores between the two independent groups were statistically significant.

For categorical data, the Chi-square test for association (hereafter just Chi-square test for brevity) with pairwise z-tests (hereafter just z-tests for brevity) was used. The null hypothesis for the z-test stated that two proportions, between two independent groups, did not differ statistically significantly, whereas the alternative hypothesis stated that it did. If the p-value was less than 0.05, the null hypothesis was rejected, and the proportions differed statistically

significantly. As the z-test was an ad-hoc test of the Chi-square, a p-value less than 0.05 could then also be interpreted as having statistically significant association between the categorical variables. For 2x2 cross-tabulations, the Chi-square test and the z-test were equivalent (had the same p-value), with the small difference that the z-test statistic was the square-root of the Chi-square test statistic. For cross-tabulations larger than this, the z-test has the advantage over the Chi-square test, of indicating precisely which percentages differ significantly from each other. Since the z-test was the same as the Chi-square test for 2x2 cross-tabulations, but gives more information for larger cross-tabulations, only the z-test statistics and its corresponding p-values were reported on in this paper when working with categorical variables. The qualitative data underwent a thematic analysis.

4.3 Results

Screening for specific learning disorder

A total of 120 learners with RWD were identified during the screening process, and 67 of those learners' parents agreed to participate in the study. Thirty-three (49.3%) learners scored 11 to 20 on the Screening Tool for Learning Disorder, thereby indicating the need for detailed assessments to confirm a diagnosis of SLD. The remaining 34 (50.7%) learners identified with RWD scored above 20, indicating a high probability of SLD. The two performance groups were therefore almost similar in size. Significant differences regarding parental perspectives between the two groups were found. Participants whose children scored between 11 and 20 on the Screening Tool for Learning Disorder reported significantly more ($z=2.170$, $p=0.030$) that their child's school performance is satisfactory (45.5%) than parents whose children scored above 20 (20.6%). Furthermore, participants whose children scored between 11 and 20 reported significantly more ($z=2.257$, $p=0.024$) attention problems and trouble following directions in their children (93.9%) compared to those whose children scored above 20 on the screen (73.5%). The results, therefore, indicated more parental satisfaction with academic work when their children were less likely to have SLD, but parents reported more difficulties with attention and following directions in this group. Attention difficulties and problems following directions may indicate other disorders than SLD. SLD is described by APA (2013) as having difficulties learning and using academic skills which may include effortful word reading, difficulty understanding the meaning of what is being read, difficulties with spelling, written expression, mastering number sense, and mathematical reasoning.

Medical and developmental history of participants' children with RWD

Among the children identified with RWD (n=67), a few parents reported that their child was born preterm with low birth weight (n=11, 16.4%). The percentage is slightly lower than the low birth weight rate (17.3%) in Mauritius, according to the health statistic report in 2015 (Ministry of Health and Wellness, 2015). 28.4% (n=19) responded that their child remained in hospital more than five days after birth due to medical complications, and 13.4% (n=9) children had feeding difficulties. A considerable number of children in the sample had a history of delayed speech and language development (n=26, 38.8%). 91.0% (n=61) attended pre-primary schools. Most learners started their pre-primary education between three and five years of age (n= 48, 78.6%), while a few had only one year of pre-primary education (n=13, 19.4%), between four and five years of age. Only six learners did not attend any pre-primary school and directly entered school in Grade 1. Most of the participants' children therefore had the opportunity to attain school readiness in the form of pre-primary education.

Participants' descriptions of their child's reading and writing skills

Participants rated their child's reading and writing skills as good, satisfactory or poor regarding specific statements in the questionnaire (Table 4.2) and by using their own words (Table 3). As shown in Table 2, most participants described their child's general academic performance as being poor (n=41, 61.2%) and stated that they exhibit poor reading and writing skills, with English and French equally affected (n=44, 65.7%). Almost one-third (n=22, 32.8%) and only four participants (n=4, 6.0%) rated their children's academic performance as satisfactory and good, respectively. In contrast, when asked about specific difficulties, more learners were reported to have problems with understanding, explaining, and remembering what was read, understanding main ideas, following directions in print, and writing sentences. While all children in the study were identified as having RWD by the teacher completed screening tool, it appears that approximately a third of parents viewed their children's general academic performance and reading and writing as satisfactory and good. It appears that when asked specific questions about the nature of their children's RWD, more participants could identify their children's RWD.

Table 4. 2 Participants' descriptions of their child's symptoms of RWD (n=67)

Descriptions	Frequency	Percentage
	n	%
Academic performance		
Poor	41	61.2
Satisfactory	22	32.8
Good	4	6.0
Reading and writing skills		
Poor	45	67.2
Satisfactory	17	25.4
Good	5	7.5
Language most affected		
English	17	25.4
French	6	9.0
Both English and French	44	65.7
Reading skills		
Difficulties understanding and explaining what is read	51	76.1
Does not remember what is read	57	85.1
Trouble understanding main ideas and follow directions in written language	56	83.6
Writing skills		
Has difficulties writing sentences. Sentences are usually short, choppy with words not written in the correct grammatical order	64	95.5

In Table 4.3, the highest number of descriptions indicated the child's difficulties as a reading and spelling problem, while some described the difficulties as either a reading or a writing (spelling) problem. Apart from RWD, participants described additional problems which include difficulties with understanding, speech and language, memory, behaviour and motivation.

Table 4. 3 Qualitative content analysis of participants' own descriptions of their child's RWD

Themes	**n**	**%**
My child has difficulties while reading and spelling	17	25.4
My child has difficulties in reading only	12	17.9
I do not get enough time to help my child with his homework	11	16.4
My child has difficulties in writing only	8	11.9
My child has confusion between some letters and often reverse the letters b/d/t/f	6	9.0
My child is slow at learning and grasping everything	5	7.5
My child does not understand anything in class	4	6.0
My child has speech and language difficulties which affect him in class	3	4.5
My child is lazy/not motivated/lack of interest	3	4.5
My child has more difficulties with spelling than reading	2	3.0
I think my child has a poor memory	2	3.0
My child cannot study because of behavioural problems	2	3.0
My child does not have any difficulties	1	1.5

Participants' descriptions of the possible causes of their child's RWD

A list of 11 possible reasons for RWD was given to participants and they had to mark all options that they regarded as applicable to their child. Nine of the options are valid causes of RWD and SLD, while being lazy is not considered a cause, although poor motivation in the child could be a consequence of RWD (APA, 2013). As shown in Table 4.4, the highest number of responses indicated that the child's RWD was due to laziness (n=25, 37.3%), the second highest number of responses, 14.9% (n=10) showed that participants did not know the reason for their child's RWD and poor performance by choosing the "I do not know" option. The third highest response showed that participants believed that their child had lower intelligence (n=8, 11.9%). A few participants indicated sensory problems in their children. Parents who reported visual and hearing difficulties in their children were referred for follow-up, even though hearing difficulties were ruled out by screening the child's hearing before parents were included in the study.

Table 4. 4 Participants' descriptions of the possible causes of their child's RWD.

Causes	**Frequency**	**Percentage**
	n	**%**
My child just seems to be lazy	25	37.3
I do not know the reason for the RWD my child experiences	10	14.9
My child has poor intellectual capacity	8	11.9
My child has a learning disorder	7	10.4
My child has visual difficulties	7	10.4
My child's RWD are because of familial problems	5	7.5
My child has a hearing difficulty	3	4.5
My child's RWD are due to existing medical condition (seizures, frequent ear infections)	3	4.5
My child has behaviour problems causing RWD	2	3.0
Poor teaching methods	2	3.0
Mismatch between home language and language of teaching and learning at school	2	3.0

Different ways in which participants assist their child with RWD

When participants were asked to choose from given options, 83.6% (n=56) reported that they help their child while doing their homework. Very few participants enrol their child for extra tuition classes (n=15, 22.4%). Almost all reported that they did not receive support and intervention from professionals such as speech-language therapists (n=66, 98.5%). A few participants responded that the professionals that could help their child might be a speech-

language therapist (n=2, 3.0%) and a special education needs teacher (n=2, 3.0%). Only 40.3% (n=27) believed there are intervention options for improving learners' RWD in Mauritius.

Significant differences between participants' responses about the causes of their child's RWD and their child's score on the Screening Tool for Learning Disorder.

The independent samples t-test indicated that participants who selected the option 'poor teaching methods' (n=2, 3.0%) had significantly (t=-2.045, p=0.045) higher scores on the Screening Tool for Learning Disorder (mean=21.00, SD=0.00) than participants who did not select the option (mean=20.06, SD=3.70). The exact same statistics and result was found for participants who selected the option 'mismatch between home language and language of teaching and learning' and those who did not select it. The significantly higher score might imply that the child's RWD could be regarded as SLD, but parents tended to select poor teaching methods and a mismatch between languages used at home and at school as causes for their child's RWD.

Significant associations between participants' demographic details and their descriptions about the symptoms, causes and the way they assist their child with RWD.

Relation to the child

The z-test revealed that there were significant differences in the responses between the mothers, fathers, and legal guardians who completed the questionnaire as the child's primary caregiver. The legal guardians selected the option 'I try to help them every day with homework' significantly less (42.9%) than mothers (84.6%) (z=2.457, p=0.014) and significantly less than fathers (95.2%) (z=3.090, p=0.002). Legal guardians also selected the option 'I am not doing anything right now to assist my child' significantly more (28.6%) than mothers (5.1%) (z=2.308, p=0.021) and significantly less than fathers (0.0%) (z=2.543, p=0.011). Thus, there was a significant association between who the caregiver is, and the amount of help provided to the child, with legal guardians appearing to be doing less to help their children with RWD.

Age group of participants

There was a significant difference between the age groups of the participants and whether they selected the option 'my child seems to be lazy', among the 11 options given for the possible reasons for RWD in their child. Participants aged between 20 and 30 years selected this option significantly less (17.4%) than those between 31 and 40 years of age (50.0%) (z=2.484, p=0.013). However, it was not significantly less than participants between 41 and 50 years of

age (41.7%). Therefore, there was a significant association between the age groups and whether RWD was attributed to laziness, with the largest group of parents between 31 and 40 years of age (47.8%) tending to attribute their child's RWD to laziness. In Table 4 it was also shown that 25 (37.3%) of the participants' perspectives were that their children with RWD were lazy. Being lazy was the most reported cause of RWD in learners.

Urban or rural living

The association between the place of living and whether the participants chose the option that the child had a particular learning disorder such as dyslexia or dysgraphia, was significant ($z=2.308$, $p=0.021$). Participants from rural areas selected the option 'My child has a particular learning disorder such as dyslexia or dysgraphia' significantly less (2.7%) than those from an urban area (20.0%). It therefore appears that participants from rural areas in Zone 2 in Mauritius were less likely to choose conditions associated with SLD as a reason for their child's RWD. It could be that they were less familiar with the terms dyslexia and dysgraphia.

Presence of conditions such as psychiatric illness, intellectual and developmental disability, autism spectrum disorder, and specific learning disorder in the family.

There was a significant association ($z=3.291$, $p=0.001$) between the presence of other conditions in the family and whether participants selected 'My child is not interested in learning how to read and write'. Participants who selected 'Yes' to the presence of familial conditions selected the option 'My child is not interested in learning how to read and write' significantly more (50.0%) than those without additional conditions in the family (8.5%). It therefore appears that the presence of conditions in the family could play a role in how parents viewed their child's RWD.

Participants who selected 'Yes' to the presence of related conditions in the family also selected the option 'I send them for private tuition lessons' significantly more (50.0%) than those without conditions in the family (18.6%) ($z=1.995$, $p=0.046$). Thus, there was a significant association between the presence of a condition in the family and the likelihood that participants sent the child for private tuition lessons. The association could mean that participants who were already familiar with related conditions in their family were more likely to seek help for their child.

Associations between participants' descriptions of symptoms and causes of their child's RWD and their child's developmental history.

There was a significant association (z= 2.241, p=0.025) between the child spending more than five days in hospital after birth and whether the participants stated that the child had trouble understanding what they have read. Participants who indicated that their child had trouble understanding what they read, selected 'Yes' significantly more (35.3%) to the question 'Did your child spend more than five days in hospital after birth?' than participants that indicated that their child does not have trouble understanding what they have read (6.3%). It therefore appears that biomedical conditions in the child after birth could play role in the child's RWD.

Earlier results already indicated that a high number of participants' children (n=26, 38.8%) had a history of speech and language difficulties. The result was further confirmed by the following significant association. There were significant associations between the learners experiencing speech and language problems as a toddler, having trouble sounding out words when they were reading (z=2.387, p=0.017) and following directions (z=2.212, p=0.027). Participants who indicated that their child had trouble sounding out words when they were reading (45.5%) and had trouble following directions (44.6%) selected 'Yes' to the question 'Did you child experience any speech and language problems as a toddler?' significantly more than participants who indicated no trouble sounding out words when reading (8.3%) or trouble following directions (9.1%). An association between a history of speech and language difficulties and the child's present RWD was therefore found. The result could indicate that the child's RWD are based on persisting speech and language difficulties.

4.4 Discussion

The study presented a rich description of participants' perspectives of symptoms and causes of their Grade 4 children's RWD in mainstream government schools in Mauritius and what they do to assist their children. A total of 67 parents and caregivers agreed to participate in the study after their child had failed the Screening Tool for Learning Disorder (Vidyadharan et al., 2017), completed by their class teacher.

Consistent with research on the male bias in RWD and SLD (APA, 2013), almost two-thirds of the learners were boys. In partial agreement with the screening tool results, majority of parents also reported that their child has RWD and performs poorly at school. However, a third of participants reported their child's academic performance was satisfactory and good, implying that they may not be aware of the child's RWD. All participants had already received

two school reports from their children by the time they were enrolled in the study. The results are confirmed by research by Johney et al. (2015) and Zivoder et al. (2017) that parents may be unfamiliar with conditions like RWD and SLD.

The two groups of learners identified with the screen, those who need further assessment and those indicating SLD, shows the usefulness of the tool. The tool could distinguish between the different degrees of difficulties among learners with RWD, which was associated with more and less satisfaction that parents expressed with their child's academic performance. The screening tool appears feasible to be used in future studies as it shows promising validity.

The early histories of the participants' children, which included prolonged hospitalization after birth, early feeding difficulties, and speech and language delay, showed links with their current RWD. RWD and SLD are commonly, but not always preceded by delays in attention, language, or motor skills (APA, 2013). These factors could be regarded as intrinsic elements (Henrique & Madeira, 2017) contributing to the learners' RWD. The findings of the study add to substantial existing evidence that language ability is foundational to skilled reading and writing and that many learners with language impairment underachieve at school and exhibit RWD (Snowling et al., 2019). Hence, there is a high degree of overlap between RWD and developmental language disorder in learners. The results of the current study confirm the overlap, with 26 (38.8.%) learners with RWD with a history of speech and language difficulties. The number of learners with low birth weight, although not higher than the national low birth weight rate, and a prolonged hospital stay after birth in the study also highlight the commonalities between birth and early medical conditions and the risk of developing language delays and RWD during school years (Debata et al., 2019; Squarza et al., 2016).

According to most participants their child's RWD were present in both English and French which is a further confirmation of true SLD (APA, 2013). The participants' own descriptions of their child's RWD tended to be general, lacking detail and describing symptoms that may not be part of the diagnostic criteria of SLD. Such statements included laziness, attentional problems, and lower intelligence. More parents, but not all, could recognise their child's difficulties when provided with descriptive statements of the nature thereof. More participants noted writing difficulties than reading difficulties in their children. Writing difficulties could be easier to identify than reading difficulties as writing provides visible evidence of difficulties in the child's exercise books that are brought home. Reading difficulties may only be identified by parents if they help their child at home. Apart from the possibility of SLD underlying the children's RWD, there could also be other underlying conditions (such as intellectual disability

when describing the child as 'slow at learning') which may be revealed when they are assessed. A recent study by Axelsson et al. (2020) investigating parental perspectives about influential factors on children's reading and writing development showed that parents felt that not only the teaching method, but also the teaching approach has an impact on their child's reading and writing development. In the same study parents also expressed concern about limited knowledge among schoolteachers and other staff members to teach reading and writing. In the current study participants with children with a high probability of SLD tended to view poor teaching methods and a mismatch between languages at home and at school as a possible cause of their child's RWD.

While the results indicated a high level of parent and caregiver awareness of their child's learning difficulties, it is concerning that approximately a third of participants appear to be unaware of the nature and causes of these difficulties. This finding agrees with that of Adlof et al. (2017) who also found that parents of children with language impairment and/or dyslexia were frequently unaware of their children's difficulties, but that they could identify reading difficulties better than oral language difficulties.

The largest group of participants ascribed their child's RWD to laziness, thereby revealing limited information on the likely causes of RWD in learners. The most reported cause of RWD in their child was also laziness. Only few participants showed awareness that their child could be having SLD, and these parents were mostly from urban areas. These findings are similar to a study by Sahu et al. (2018) who found that most parents did not have information about SLD and thought that the poor behaviour of their child such as disinterest in learning, attention deficit and lack of motivation were the reasons for poor school performance. Due to limited parental awareness about RWD and SLD in the current study, parents were not fully aware of the learning and behavioural difficulties of their child with RWD at home and school. Their child's behaviour, attitude and concentration-related problems were incorrectly considered responsible for their RWD, thereby not warranting immediate action. It could also be that the participants' children had attention deficit hyperactivity disorder when further investigated.

Key contributing factors to poor reading and writing abilities include low confidence of learners, poor attention to phonics instruction and phonological awareness skills in class, lack of learner motivation to learn to read, and the shift away from phonics instruction to reading comprehension in the third grade (Mohammed & Amponsah, 2018). The current study also revealed that a mismatch between the learner's home language (91% speak Mauritian Creole

at home) and the language of learning and teaching (English or French) could play a role in the learners' RWD.

Parents around the globe who are assisting with homework may often feel frustrated when their child continues to fail assessments and does not respond to their methods to support their child's academic performance (Chien & Lee, 2013). A few extrinsic factors were revealed that could contribute to RWD in participant's children. In the current study, legal guardians appear to need more assistance to support their child with RWD. Most parents in the study stated that they help their child with homework, and a few made use of private tuition, notably those with psychiatric and other conditions in the family. Almost no participants sought assessment and intervention from professionals trained in RWD/SLD such as speech-language therapists. The lack of intervention initiated by parents could also relate to the shortage of these professionals in Mauritius. At present there are only 27 registered members registered with the Speech-Language Therapy Association in Mauritius, with 16 being self-employed, three employed in private companies, eight in public service (two in schools and six in hospitals). Due to a shortage, particularly in schools, parents may therefore be unfamiliar with their services.

Strengths and limitations of the study

Valuable parental perspectives about RWD in children were attained which can be shared with teachers, speech-language therapists and the Ministry of Education. The results show the importance of raising awareness about RWD and SLD among parents. To the authors' knowledge, this is the first study of its kind in Mauritius. Because the sample was substantial (n=67) and included a fair distribution of urban and rural areas, the findings may be generalised to parents of Grade 4 children with RWD in Mauritian mainstream government schools. Limitations of the study include a lack of knowledge of parental emotions about their child's difficulties and their self-perceived needs. Future research should investigate parental recommendations on how the education system in Mauritius could support learners with RWD in government schools. Research should also investigate the influence of a mismatch between the learner's home language and the language of learning and teaching.

4.5 Conclusion

The study confirms that there are limited resources available to parents and caregivers of children with RWD in mainstream primary government schools in Mauritius. Parents and caregivers have limited perspectives on the symptoms and causes of their child's RWD. They are clearly unaware of appropriate interventions to support their child. Each child in the current

study needs a comprehensive assessment to determine the nature and cause of their RWD and possible SLD. It is important to inform parents that RWD in children must be promptly identified and diagnosed. The most encouraging aspect of the results is that participating parents were willing to help their children, even though they were uninformed and not supported. There should be a comprehensive approach to identification, assessment and intervention of learners with RWD in Mauritius. Therefore, more professionals such as speech-language therapists should be available to support parents and provide intervention for learners with RWD. Having adopted an inclusive education approach (Ministry of Education and Human Resources, 2017), the Ministry of Education, schools, teachers and speech-language therapists have the opportunity to implement inclusive policies for learners with special education needs in mainstream primary schools and their parents in Mauritius.

CHAPTER 5

Grade 4 learners with reading and writing difficulties in mainstream government schools in Mauritius

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Abstract

Background: Learners with reading and writing difficulties (RWD) are accommodated in Mauritian government schools without formal curriculum adjustment and teacher support. Little is known about their RWD. The aim was to describe the characteristics of Grade 4 learners with RWD.

Method: Grade 4 learners with RWD from 20 randomly selected schools were identified with the Screening Tool for Learning Disorder (STLD). Parents of 67 learners with RWD (research group [RG]) gave consent. 49 learners without RWD were selected as control group (CG) based on academic performance and consent. Hearing loss and visual impairment were excluded. The Clinical Evaluation of Language Function Observation Rating Scale (CELF-5 ORS), the Schonell Spelling Test and the Gray Oral Reading Test were used.

Results: The CELF-5 ORS showed a wide range of difficulties of the RG with speaking, listening, reading, and writing. There were significant differences between the RG and CG with reading and spelling. Despite being in Grade 4 (mean age 9.0 years), the mean spelling age for the RG was 5.5 years, corresponding to a Grade 1 level. Positive correlations were found between the STLD and listening, speaking, and reading on the CELF-5 ORS for the RG. The more likely participants had specific learning disorder on the STLD, the worse the spelling. Those with a history of speech and language delay performed poorer with reading and spelling.

Conclusion: Difficulties were confirmed by all the measures. Diagnostic assessments for specific learning disorder are required to exclude intellectual disability and other comorbidities. There is a dire need for intervention programs for learners with RWD in mainstream government schools in Mauritius. Programs should include speech-language therapists and aim at prevention, identification, diagnosis, and intervention.

Keywords: Grade 4 learners, reading and writing difficulties, mainstream government schools, Mauritius, specific learning disorder

5.1 Introduction

Reading and writing difficulties (RWD) refer to an undiagnosed collection of learning difficulties underlying reading and writing. The learner may experience difficulties with accurate and/or fluent word recognition and decoding and encoding abilities which typically result from a deficit in knowledge about the phonological component of language (Prestes & Feitosa, 2017). Delays in the development and production of phonological codes include deficiencies in auditory perception and discrimination of phonemes (Ozernov-Palchik & Gaab, 2016), phoneme-grapheme correspondence (Boros et al., 2016; Law et al., 2018), phonological awareness (Cavalli et al., 2017) and phonological memory (Kastamoniti et al., 2018). Secondary consequences of RWD may include problems in reading comprehension and reduced reading experience that can impede the growth of a child's vocabulary and background knowledge (Alt et al., 2017). These difficulties significantly impact a child's ability to access the school curriculum and achieve academic success. RWD and specific learning disorders when diagnosed, account for higher rates of school dropout, psychological distress, unemployment, and lower income in later life (American Psychiatric Association [APA], 2013). Failure to address RWD can lead to low self-esteem, anger, behavioural problems, and depression in the child (Novita, 2016; Zarkowska & Clements, 2018). Little is known about learners with RWD in Mauritius, a low- to middle-income country (LMIC) with an understudied context.

While it is estimated that 5 to 15% of all school-age children across cultures experience RWD the condition is also influenced by socio-economic backgrounds (Peterson & Pennington, 2015; Rapin, 2016; Shifrer et al., 2010). Epidemiological studies, mostly from high-income countries (HICs) report that the prevalence of reading deficits is approximately 4 to 9%, and 3 to 7% for deficits in mathematics among learners (APA, 2013). The prevalence of learners with RWD appears to be higher in LMICs. A study in Edirne City, Turkey, for example, found

13.6% of learners with reading impairment, 6.9% with writing impairment and 6.5% with mathematical impairment (Görker et al., 2017). LMICs face numerous challenges relating to the identification and intervention of learners with RWD. The education systems in LMICs often do not have sufficient resources to support schools with teaching aids, train teachers to use alternative teaching methods, collect data, and monitor the performance of learners with RWD in an inclusive education environment (Kim et al., 2020). Another factor in LMICs is high learner-teacher ratios at primary level education. In Chad, Malawi and Rwanda the learner-teacher ratios were reported to be 62:1, 70:1, and 58:1, respectively (UNESCO, 2017). In Madagascar there is one trained primary level teacher on average for every 273 pupils (UNESCO, 2017). A study on teacher perspectives of learners with RWD in mainstream government schools in Mauritius revealed that the number of learners in classes ranged between 15 to more than 35 which indicates variation across countries (Veerabudren et al., 2021). Many teachers are not adequately trained to support learners with RWD in an inclusive education setting (Veerabudren et al., 2021). A low remuneration scale may also decrease teachers' job satisfaction (Gamero Burón & Lassibille, 2016). Furthermore, a low adult literacy rate in LMICs has implications for learners' learning in the home and negatively impacts modelling of literacy behaviours (UNESCO, 2017). These factors, typically not found in HICs, present serious challenges for formal identification practices of learners with RWD, implementing reading and writing interventions, and improving learners' learning.

Identification practices for learners with RWD are highly refined in HICs, with many countries developing a set of standards that can be followed to ensure appropriate assessment of learners with RWD (Agrawal et al., 2019; Gündoğmuş, 2018). Initiatives are aimed at teacher training to facilitate the identification of learners with RWD and intervention, using current evidence-based strategies (Mather et al., 2020). Countries are adapting and modifying the national curriculum to promote individualised instruction by developing Individual Education Plans through a multidisciplinary process involving parents, teachers, administrators, the learner, other relevant support staff and service providers, such as speech-language therapists to establish better learning goals (Alkahtani & Kheirallah, 2016).

In contrast, in LMICs such as Mauritius and South Africa, educational practices have not yet been fully developed to include all learners with special needs (Adewumi & Mosito, 2019). Recommendations from HICs cannot be directly applied because of differences in the educational systems and the characteristics of learners and families who access services. In Mauritius the characteristics of RWD in school-age children are not fully known. To date, no

research study could be found investigating RWD among young learners in Mauritius. There appears to be a lack of awareness about RWD and intervention options for learners with RWD among educators and parents. Research on perspectives of teachers on learners with RWD in Mauritius showed that teachers were able to identify learners with such problems in their classes but were unaware of symptoms and causes of RWD (Veerabudren et al., 2021). Teachers do not receive any training in inclusive education or how to assist learners with RWD in a regular classroom (Veerabudren et al., 2021). A study about the perspectives of parents with learners with RWD in the same setting also showed that parents have limited information about the symptoms and causes of their child's RWD, therefore describing learners with RWD mostly as lazy or ascribing RWD to poor teaching methods. Parents were also unfamiliar with appropriate interventions to support their child with RWD. (Veerabudren et al., In press).

Based on the first author's personal knowledge of the Mauritian context, most learners acquire Mauritian Creole (a French-based creole language) as their first language and French as a second language before the age of three. Children typically start their education from age five through the medium of English (Ministry of Education and Human Resources, 2006). Apart from the multilingual context, there is also a disconnect between the use of oral and written languages. While Mauritian Creole dominates as the most frequently spoken first language of the population, it is not the language of learning and teaching in Mauritius. English and French are the main oral and print languages for commerce and education (Owodally, 2013; Sonck, 2005). When children enter the first grade, they are Mauritian Creole-French bilinguals who are required to respond to the academic demands in English and French as medium of instruction. In such a complex linguistic situation, it is important to describe the characteristics of learners with RWD.

Grade 4 learners aged between eight and nine years may be the most appropriate population to investigate in such a study as a learner typically becomes a sophisticated reader by nine years of age (Abbott et al., 2010). Grade 4 learners are typically able to read and write independently at sentence level to meet academic demands (Horowitz-Kraus et al., 2017). A better understanding of the characteristics of learners with RWD in Mauritius may create awareness of the need for intervention and open a pathway to diagnosis and inclusive education practices to be implemented in classrooms. The aim of the study was to describe the characteristics of Grade 4 learners with RWD in mainstream government schools in Mauritius.

5.2 Method

Research design and research ethics

The study used a descriptive research design to investigate the characteristics of learners with RWD. Since no normative data exist in Mauritius to compare the participants' performance on measures developed in other settings, a control group (CG) of learners without RWD was utilised as comparison to interpret the results of standardised measures that were used in the study.

Clearance from the Ethics Committee (HUM018/0520) of the University of Pretoria, South Africa and the Ministry of Education of Mauritius was obtained. Permissions from 20 randomly selected mainstream government schools in educational Zone 2 in Mauritius were obtained to identify learners with and without RWD in Grade 4 classes. The zone has a near equal distribution of urban and rural schools. Once identified by teachers with the Screening Tool for Learning Disorder [STLD] (Vidyadharan et al., 2017) and academic performance, all prospective participants' parents were approached to give informed consent that their children could participate in the study. Learners gave assent by verbally agreeing to participate and wrote their names on a consent page. All learners with RWD (RG) were referred for follow-up after completion of the study.

Selection of participants

For the purpose of the study, RWD refer to persistent academic learning difficulties regarding reading accuracy, reading comprehension, and spelling across the different languages of instruction, English and French, which are both used as mediums of instruction in Mauritius. Inclusion criteria were that learners should have been in Grade 4, aged between eight and nine years old, and attending a government primary school at the time of data collection. The RG was identified using the STLD developed by Vidyadharan et al. (2017) in India. The screening tool was therefore developed in a similar LMIC to the island of Mauritius. The STLD contains 26 items from the domains of reading, writing, spelling, and mathematics, but the different domains are not scored separately. According to the tool, a total score of 11 to 20 indicates a need for an assessment to confirm a learning disorder and a score of >20 signals a learning disorder. Inclusion criteria for RG (n=67) was based on a score of 11 or higher on the screening tool to be identified with RWD (see Table 5.1). The CG (n=49) comprised of typically achieving learners without any RWD, randomly selected by their teachers based on their latest exam performance in class. The presence of a hearing difficulty in both groups was ruled out by a hearing screening test, validated by Mahomed-Asmail et al. (2016) for school children.

All participants had audiological thresholds within normal limits (below 15dB) across three frequencies, 500, 1000 and 2000Hz. Hence, they all passed the hearing screen except for one prospective participant who was then referred for diagnostic testing and eliminated from the study sample. There were no visual difficulties observed, but five participants in the CG wore spectacles at the time of data collection. Table 5.1 summarises the gender and age for the RG and CG, and STLD score of the RG, where SD and IQR stand for standard deviation and interquartile range, respectively.

Table 5. 1 Participant description (n=116)

Variable	Statistic	Research group n=67	Control group n=49	Test statistic	p-value
Gender					
Male	*n*=68 (58.6%)	38 (32.8%)	30 (25.8%)	z= 0.487	0.626
Female	*n*=48 (41.4%)	29 (25.0%)	19 (16.4%)		
Age in years	Mean	9.0	9.3	MW = 118.500	0.003
	Median	9.1	9.3		
	SD	0.5	0.3		
	IQR	0.4	0.3		
STLD Score	Mean	20.1	-		
	Median	21	-		
	SD	3.6	-		
	IQR	5	-		

There was a significant difference in age between the two groups, with the RG on average three months younger than the CG. The two groups, however, had an equal number of years of education as they were all in Grade 4. There was no difference in gender distribution between the two groups.

Among the RG (n=68), several learners had a history of delayed speech and language development (n=26, 38.8%) as reported by their parents in a questionnaire. Their educational

history showed that most RG participants had the opportunity to attain school readiness in the form of pre-primary education (n=61, 91.0%). Only three participants had a preterm birth and a hospital stay after birth, but they did not have any illness.

Material

Once the participants of both groups were identified by the teachers with the assistance of the researcher using the STLD, the Clinical Evaluation of Language Function, fifth edition Observation Rating Scale [CELF-5 ORS] (Wiig et al., 2013) was independently completed by the RG participants' class teachers to cross-verify the findings of the STLD. The CELF-5 ORS was used to obtain a systematic observation of listening, speaking, reading and writing skills of the RG in the classroom. These observations helped in obtaining a better profile of the RG in the domains generally affected in learners with RWD. Data were collected towards the end of the schoolyear in 2020 so that teachers could have known the learners in their classes well. The researchers regarded the teachers' observations of the RG's difficulties as valuable and anticipated that the use of the CELF-5 ORS by teachers could have created awareness of the importance of formal identification of learners with RWD in their classes. The parents of the RG also completed a questionnaire which consisted of questions related to their medical and developmental history. The parents' responses were used to investigate relationships between medical and developmental history and characteristics of learners with RWD.

Two assessment tools, the Gray Oral Reading Test, fourth edition (GORT-4) and the Schonell Spelling Test were used to investigate the reading and spelling characteristics of Grade 4 learners in both the RG and CG. The GORT–4 (Wiederholt & Bryant, 2001) is widely known as an objective measure of oral reading progress and diagnosis of oral reading difficulties. Four different scores provide comprehensive information about a learner's Oral Reading Skills Rate (the amount of time taken by a learner to read a story); Accuracy (the learner's ability to read each word in the story correctly); Fluency (the learner's rate and accuracy scores combined) and Comprehension (the appropriateness of the learner's responses to questions about the content of each story read). The GORT-4 includes two forms, A and B containing 14 developmentally sequenced reading passages each and five comprehension questions related to each passage. Standard scores, percentile ranks, grade equivalents, and age equivalents are provided for each score. Form A was used in this study as it is the pre-intervention test stimulus. Since studies show an absence of bias for gender and ethnicity in the GORT-4 stories and questions, it appeared to be an appropriate test to use in Mauritius (Craig et al., 2004; Speltz et al., 2017).

The Schonell Spelling Test (Schonell, 1952) consists of a list of 100 graded words, which are read out aloud while the participants wrote the words. The test is widely used by psychologists and special educators to provide reliable results about spelling errors and spelling age of learners across grade levels (Chmilar, 2016). The words used in the Schonell Spelling Test appeared to be appropriate for the Mauritian population. No words with unfamiliar cultural references were identified. To verify the relevance of the tests before data collection, the researcher administered both the GORT-4 and the Schonell Spelling Test to five Grade 4 learners without RWD in Mauritius. The learners were familiar with all words in the spelling test and could read the passage on Grade 4-level without any difficulty. The CG data were used as local reference for the Schonell Spelling Test and GORT-4 RG scores.

Data collection procedure

Parents of the RG completed the parent questionnaire. The researcher familiarised the teachers with the CELF-5 ORS and requested them to complete the scale for the RG. Since data collection was conducted at the end of the academic year, the teachers were familiar with their learners and reported no difficulty completing the scale. After participants gave assent to participate, the two tests (GORT-4 ORS and the Schonell Spelling Test) were administered individually in a quiet room according to test instructions. The administration time for the GORT-4 typically ranged from 15-30 minutes. The researcher determined the first reading passage level for each participant by using the entry point according to the grade level in the table provided in the examiner's booklet (Wiederholt & Bryant, 2001). Participants were provided with the passage and requested to read it orally as "carefully and quickly as you can" (Wiederholt & Bryant, 2001). Participants' reading was timed with a cell phone stopwatch and deviations from the print were noted as the participant read the passage. Following the reading evaluation, the researcher removed the passage, read the comprehension questions to participants and noted their answers. Testing continued until a ceiling had been reached, determined by the Fluency score. The ceiling is reached when a participant exceeded the maximum number of misread words permitted in the stories. In this study, the RG could only read to Story 4 while the CG read to Story 12.

Following the reading test, the Schonell Spelling Test was carried out. Participants were provided a piece of lined paper, coded at the top. The researcher dictated each word, saying the word individually, then in a sentence and finally repeating the single word again (e.g. time - Can you tell me the time? – time). The dictation was slow and clear, participants were not rushed, and words were repeated as often as needed. The test was discontinued when 10

consecutive errors were made. The approximate duration of the entire data collection session for the RG was 20 to 30 minutes, whereas the CG required longer time, approximately 45 minutes as they could read more stories in the GORT-4.

Data analysis

The raw data obtained from the CELF-5 ORS, the GORT-4 and the Schonell Spelling Test were tabulated using alpha-numerical codes to ensure the confidentiality of the participants' data. Scores of the CELF-5 ORS are obtained by calculating the number of statements that obtained a mark, i.e., the teacher indicated a 'yes' for the statement. The maximum score indicating difficulties (number of 'yes' statements) for listening skills is 14, speaking skills is 24, reading skills is 6 and writing skills is 6. Four different scores, namely reading rate, accuracy, fluency, and comprehension, were obtained from the GORT-4. Standard scores, percentile ranks, grade equivalents, and age equivalents are provided for each score. The spelling scores of the participants were obtained from the Schonell Spelling Test by dividing the total number of words correctly spelled by 10. The number is then added to five. A conversion table to convert tenths of a year into months is used to obtain the spelling age of participants.

The coded data were analysed using descriptive statistics, such as frequencies and percentages using the SPSS version 26. For continuous variables, we tested for normality using the Shapiro-Wilk test. Since none of the p-values was greater than 0.05, we did not have normality. Accordingly, nonparametric tests were used for statistical analysis of the continuous variables, such as to determine significant differences between the two study groups (Mann-Whitney (MW) test) and correlations (Spearman) between data. Spearman correlations were reported as 'rs' as the custom for nonparametric data. For categorical variables, the two-proportions z-test was used to test for differences in proportions between the RG and CG. If the p-value was <0.05, the difference (MW and z-test) or the correlation (Spearman) is statistically significant. Possible correlations were investigated between the outcomes of the STLD used to identify Grade 4 learners with RWD, the CELF-5 ORS, GORT-4 measures, and the Schonell Spelling Test. Correlations between the RG's developmental history obtained through the parent questionnaire and their performance on the GORT-4 and Schonell Spelling Test are described.

5.3 Results

The characteristics of Grade 4 learners with RWD are described according to scores on the CELF-5 ORS regarding listening, speaking, reading, and writing skills as completed by their

classroom teacher. Reading and spelling abilities are shown by performance on the GORT-4 and the Schonell Spelling Test and compared with those of the CG.

CELF-5 ORS findings

Table 5.2 summarises the descriptive statistics of the CELF-5 ORS for the RG, which shows that most of the language function difficulties were observed in reading and writing skills. The results showed the wide range of difficulties the RG experiences with speaking, listening, reading, and writing. The RG obtained a mean score of 8.6 out of 14 for difficulties in listening skills, indicating that most participants experienced more than 50% of the difficulties reported in the CELF-5 ORS items for listening skills. The SDs for listening and especially for speaking skills indicate a large variation, with scores widely dispersed from the mean scores, also indicated by the IQR.

Table 5. 2 Descriptive statistics of the CELF-5 ORS for the RG (n=67)

Domains	Maximum error score	Mean	Median	SD	IQR
Listening skills	14	8.6	9	3.6	5
Speaking skills	24	14.4	14	6.4	8
Reading skills	6	5.6	6	0.8	0
Writing skills	6	5.8	6	0.5	0

The RG's difficulties with reading and writing skills also reflected in the scores obtained on the STLD (Mean=20.1, SD=3.6). However, the RG also failed many items pertaining to their listening and speaking skills on the CELF-5 ORS which indicate significant difficulties with receptive and expressive language skills.

Correlations between the STLD and CELF-5 ORS domains for the RG

Positive correlations were found between the STLD and the listening, speaking, and reading domains of the CELF-5 ORS for the RG. The higher they scored on the screening tool (which indicates a higher risk for learning disorder), the more difficulties were observed in their listening ($r_s=0.49$, $p<0.001$), speaking ($r_s=0.48$, $p<0.001$), and reading ($r_s=0.24$, $p=0.046$) skills. The positive correlation shows the validity of the STLD, a screen which is not as widely used as the CELF-5 ORS, to identify learners with RWD.

Reading ability

Table 5.3 shows the comparison between the RG and CG for the GORT-4 results, with a significant difference in all measures of the test. The mean standard score on the GORT–4 (Mean=5.3, SD=3.1) for the RG was significantly below that of the CG (Mean=28.0, SD=3.9, p<0.001). When the standard scores of the RG were converted to calculate the oral reading quotient, most RG participants scored below 79, which indicates "poor" to "very poor" performance for oral reading skills. The RG also had significant difficulties with reading comprehension (Mean=6.2, SD=7.0) compared to the CG (Mean=40.7, SD=12.0, p<0.001).

Table 5. 3 Comparison between the RG and CG for the GORT-4

GORT-4 measures		Research group n=67	Control group n=49	MW	p-value
Standard Score	Mean	5.3	28.0	0.00	<0.001*
	Median	4.0	27.0		
	SD	3.1	3.9		
	IQR	3.0	7.0		
Reading Comprehension	Mean	6.2	40.7	77.0	<0.001*
	Median	4.0	41.0		
	SD	7.0	12.0		
	IQR	9.0	18.0		
Reading Rate	Mean	4.0	31.9	0.00	<0.001*
	Median	1.0	34		
	SD	4.9	4.3		
	IQR	8.0	7.0		
Reading Accuracy	Mean	4.3	37.2	2.0	<0.001*
	Median	2.0	39.0		
	SD	5.7	5.9		
	IQR	9.0	9.0		
Reading Fluency	Mean	8.3	67.7	0.00	<0.001*
	Median	4.0	66.0		
	SD	10.4	9.0		
	IQR	17.0	9.0		

* Significant at 5% level of significance

Spelling ability

Table 5.4 shows the comparison of the RG and CG for the Schonell Spelling Test, with significant differences between the two groups on all measures. The majority of learners with RWD in the RG had great difficulties with spelling. Despite being in Grade 4 and having a mean chronological age of 9.0 years, their mean spelling age was 5.5 years which corresponds to a Grade 1 level.

Table 5. 4 Comparison between RG and CG on the Schonell Spelling Test

		Research Group n=67	Control group n=49	MW	p-value
Number of Words Correctly Spelt (NWCS)	Mean	6.0	43.2	0.00	<0.001*
	Median	3.0	45.0		
	SD	7.4	8.4		
	IQR	10.0	13.0		
Total Score	Mean	5.7	9.3	49.0	<0.001*
	Median	5.3	9.5		
	SD	1.4	0.8		
	IQR	0.9	1.4		
Spelling Age	Mean	5.5	9.3	0.00	<0.001*
	Median	5.4	9.4		
	SD	0.7	0.8		
	IQR	0.8	1.3		

* Significant at 5% level of significance

Correlations between the STLD and Schonell Spelling Test for the RG

A negative correlation was observed between the STLD, and the number of words correctly spelled on the Schonell Spelling Test. The higher their score on the STLD, indicating a high risk for learning disorder, the poorer the spelling scores (rs=-0.24, p=0.04). Participants who scored lower on the spelling test also had a poor standard score on the GORT-4 (rs=0.28, p=0.01). The correlations between the different instruments indicate the validity and reliability of the results.

Correlations between the RG's speech and language developmental history, the Schonell Spelling Test and GORT-4.

RG participants whose parents reported that their child had a history of delayed speech and language as a toddler performed significantly poorer in the Schonell Spelling Test (rs=-0.27, p=0.02) and the GORT-4 (rs=-0.35, p<0.001). Therefore, negative correlations were found between reported speech and language delay in the past and current spelling and oral reading skills.

5.4 Discussion

The characteristics of learners with RWD showed that they have significant difficulties to learn and use the academic skills of reading and writing, both on teacher reported measures and their actual performance on the GORT-4 and the Schonell Spelling Test in comparison with peers without RWD. Several correlations between the different measures show the validity and

reliability of the results. It is unlikely that the significant difference in age between the RG (Mean age 9.3 years) and CG (Mean age 9.0 years) can account for the severity of RWD in the RG as the two groups had similar educational opportunities.

The results of the study provided a rich description of RWD in the RG. Apart from scoring close to the maximum error scores for reading and writing on the CELF-5 ORS, most participants in the RG scored more than 50% of difficulties in the domains of listening and speaking, which relate to receptive and expressive language difficulties. Those with a parent reported history of speech and language delay in the RG performed poorer on the Schonell Spelling Test and GORT-4. The results reinforce the association between language difficulties and RWD (Adlof & Hogan, 2018). Many research studies have underscored the hypothesis that the presence of developmental language disorder increases a learner's risk of experiencing RWD and poor academic achievement when compared to learners with typical language skills (Del Tufo et al., 2019; Price et al., 2021). Listening and speaking difficulties could significantly limit a learner's classroom participation and learning of basic reading and writing skills. There was a large variation in SDs for listening and speaking skills in the RG, indicating widely dispersed scores from the means. A possible explanation may be that learners with RWD experience listening and speaking difficulties which may vary in severity (Tran & Duong, 2020). The widely dispersed scores may not only indicate differences in severity but also variations in the nature of the RG learners' ongoing language difficulties.

No such variations in SDs were observed for reading and writing skills on the CELF-5 ORS. Almost all learners in the RG showed the maximum difficulties in reading and writing abilities (5.6 out of 6 and 5.8 out of 6 respectively). The more likely the participant had specific learning disorder on the STLD, the fewer words were spelled correctly. These findings correlated well with the STLD results, showing the feasibility of using the screening tool for early detection of RWD and the risk for specific learning disorder.

The reading skills of the RG was significantly poorer than that of the CG on the GORT-4. The RG showed consistent inaccurate and effortful reading due to difficulties in sounding out words. Their reading comprehension scores also showed that they had significant difficulties in understanding the meaning of what is read compared to the CG. The findings also indicate that the GORT–4 might be a useful instrument for identifying the oral reading proficiency of learners in Mauritius. The GORT–4 scores for the CG were close to the standardised mean scores of the test. Similarly, the RG's spelling accuracy was significantly below their

chronological age, corresponding to Grade 1 learners while the CG scores matched their chronological age and grade level on the Schonell Spelling Test.

With the battery of measures used, it is evident that several academic domains are affected in the RG. According to the diagnostic criteria for specific learning disorder the severity of the RGs difficulties may then be described as moderate to severe (APA, 2013). Hence, the RG shows distinctive features of specific learning disorder rather than mere RWD. However, diagnostic assessments must still be carried out as recommended by APA (2013) to distinguish the RG participants' RWD from intellectual disability, neurological disorders, psychosocial adversity, lack of proficiency in the language of learning and teaching, or inadequate educational instruction. The presence of sensory disorders such as hearing impairment and visual impairment were already ruled out in the study. Learners with conditions such as attention deficit hyperactivity disorder, neurological disorder, autism spectrum disorder may show RWD as well, but these conditions were not reported by the parents nor observed by the researcher during administration of the tests.

The presence of ongoing speech and language difficulties in some of the participants in the RG supports the existence of developmental language disorder in the group. The role of language skills in the development of reading and writing has been continuously supported by scientific evidence in psycholinguistics, cognitive psychology and neuroscience (Navas et al., 2017). It is therefore unquestionable that speech-language therapists are an essential part of prevention, assessment and intervention of RWD (American Speech-Language-Hearing Association, 2001).

The study has several implications for Mauritius. A set of carefully selected assessment material should be available for use by educational psychologists and speech-language therapists working in the Ministry of Education in Mauritius. This collaboration may promote early identification of learners with specific learning disorder and conditions which may underlie inattentive behaviour, disorders of speech and language, or impaired cognitive processing in the early grades. Speech-language therapists should be given the opportunity to train teachers to implement specific teaching strategies, adjust the curriculum and provide intervention programs for learners with RWD in an inclusive education setting, with the expectation of meeting the demands of the national curriculum (Hogan, 2018).

Limitations of the study are that the multi-lingual environments of participants, their proficiency in the language of learning and teaching, and their home literacy environments

were not investigated. There were also no developmental histories of the CG available to make comparisons between the groups. The limitations indicate future research priorities.

5.5 Conclusion

Most participants in the RG had moderate to severe difficulties in both reading and writing skills, indicating a high risk for specific learning disorder when comorbidities can be excluded. Significant differences between the performance of the RG and CG indicated the validity of measures used and there was no evidence of discrimination against a distinctive cultural and linguistic sample of Mauritian learners. The study is important for speech-language therapists working in the education system. There is a dire need to implement intervention programs for learners with RWD in mainstream government schools in Mauritius. These programs should not only involve identification and assessment but also provide for adjustments to the national curriculum, teacher training and classroom accommodations. Speech-language therapists play an important role in programs for the prevention of specific learning disorder, addressing speech and language delays in early intervention and promoting emergent literacy.

CHAPTER 6

DISCUSSION, IMPLICATIONS AND CONCLUSION

Chapter aim: The aim of the chapter is to summarise and draw conclusions from the research findings, to discuss the implications and to critically evaluate the research that was conducted. Recommendations for future research are made. A formal literacy intervention program for learners with reading and writing difficulties in an inclusive education setting in Mauritius is proposed.

6.1 Introduction

Mauritius recognises the importance and necessity to implement inclusive education for all learners (Ministry of Education and Human Resources, 2017). For learners with RWD in particular, the implementation of inclusive education with all the supports can make a critical difference. Supports for inclusive education involve the use of a variety of teaching techniques, resources, a differentiated curriculum and instructions aligned with individual learning styles (Lindner & Schwab, 2020). The number of learners experiencing RWD in mainstream government schools in Mauritius is still unknown. Existing documentation of such learners according to the 2017 statistics (Education Statistics, 2017) only reflects learners diagnosed with specific learning disorder and attending special education schools.

Like many countries, the inclusive education policy for learners with SEN in Mauritius (Ministry of Education and Human Resources, 2006) is based on international guidelines such as the Salamanca Statement (UNESCO, 1994) and Guidelines for Inclusion: Ensuring Access to Education for All (UNESCO, 2005). At present, a learner with RWD in a mainstream government school in Mauritius is most likely expected to meet the curriculum demands in regular classrooms. There are limited adapted resources and materials available, while specific teaching strategies to facilitate the teaching and learning of learners with RWD are largely lacking. It is within this context that the present study was conducted.

It would be justified to propose that for learners with RWD to benefit from inclusive education, the perspectives of their parents and regular classroom teachers are of key importance (Joshi et al., 2016; Pit-ten Cate et al., 2018). It was anticipated that by involving parents and teachers as research participants could already raise some level of awareness of the need for a coordinated intervention plan for learners with RWD in Mauritius. It was also anticipated that investigating the characteristics of learners with RWD in mainstream government primary schools where the

national curriculum is implemented, will give evidenced-based information about how to better support such learners in an inclusive education setting.

6.2 Summary of research findings

Three studies were conducted to meet the aim of the current research project. The aim of the research was to describe parental and teacher perspectives towards learners with RWD and to describe the learner characteristics in Mauritius.

The findings of Study 1 contributed to existing findings in other LIMCs about challenges teachers experience in inclusive education settings (Faragher et al., 2021; Hettiaarachi et al., 2018; Price, 2018). The sample of teachers in Mauritius, despite being well qualified (the minimum qualification was a certificate while the maximum qualification was a postgraduate degree), do not have sufficient knowledge about appropriate intervention of learners with RWD to support them in a regular classroom. They were not familiar with the multidisciplinary team involved in the assessment, diagnosis, and intervention of learners with RWD, which could help them with learners with challenges. Teachers were largely unfamiliar with possible underlying causes of RWD like specific learning disorder, auditory processing difficulties, and attention deficit hyperactivity disorder. They could identify the assets of learners with RWD which can facilitate their inclusion in regular classrooms but anticipated that learners with RWD may display behaviour problems in regular classrooms. The participating teachers had resourceful but limited ideas of strategies that may assist learners with RWD in a regular classroom.

Teachers who participated in Study 1 had no training in inclusive education principles or how to assist learners with RWD in a regular classroom. However, they agreed that an inclusive education setting may foster a better understanding and acceptance of differences among learners, but clearly indicated a preference for special education schools. Participants mostly viewed inclusive education as detrimental to learners with RWD, probably because they felt they could not meet the needs of learners with RWD and that they had insufficient knowledge to teach them. Large teacher-student ratios in regular classrooms and the lack of time to give special attention to learners with RWD or to adapt teaching methods account for teachers' preference for special education schools (Kalsoom, 2020; Saloviita, 2020). Encouragingly, the majority of participating teachers were willing to accommodate learners with RWD in their classrooms, provided that they receive extensive retraining to support learners to achieve literacy goals. They expressed an interest in training in inclusive education to support learners with RWD.

In Study 2 parental perspectives towards their child with RWD presented valuable information about what parents knew about their child's difficulties, RWD symptoms and causes, and what they do to assist their children. A mismatch between the learner's home language (91% speak Mauritian Creole at home) and the language of learning and teaching (English or French) was found. Only two-thirds of parents reported that their child has RWD and performs poorly at school which was not in correspondence with the findings of the STLD. The remaining one-third of parents described their child's performance as satisfactory or even good, despite all their children showing a risk of specific learning disorder when the screening tool was administered.

Parents confirmed that their child's RWD present in both English and French, but attributed RWD to laziness, attentional problems, and a lower intelligence. However, some parents could recognise their child's difficulties when provided with descriptive statements of the nature and symptoms of RWD. Their descriptions indicated more writing difficulties than reading difficulties. Nearly 40% of learners identified with RWD also had speech and language difficulties in their early years. Even though the results indicated that the most parents were aware of their child's learning difficulties, it is concerning that approximately a third of participants appear to be unaware of the nature and causes of these difficulties. Most parents in the study assisted their children to do their homework while those who were legal guardians required more assistance to support their child in a similar way. Few parents and legal guardians sought private tuition to help their child. Showing their limited awareness of appropriate intervention options, almost all parents did not seek diagnostic assessments and intervention from professionals such as SLTs who are trained in the intervention of RWD.

The outcomes of Study 3 showed that participating learners did not only show significant RWD according to the CELF-5 ORS, but also showed varied difficulties with listening and speaking skills. The STLD scores and the listening, speaking, and reading domains of the CELF-5 ORS for learners with RWD were positively correlated. The higher they scored on the screening tool, the more difficulties were observed in their listening, speaking, and reading. This positive correlation shows the validity of the STLD and the CELF-5 ORS scores. The GORT-4 scores indicated that most learners with RWD had moderate to severe difficulties in both reading ability and reading comprehension. Similarly, most participants with RWD had great difficulties with spelling. Despite being in Grade 4 and having a mean chronological age of 9.0 years, their mean spelling age was 5.5 years which corresponds to a Grade 1 level. The higher the score on the STLD, indicating risk for specific learning disorder, the poorer were the spelling abilities and the standard score on the GORT-4. Significantly, participants with RWD

with a history of speech and language difficulties in the early years performed significantly poorer with spelling and reading.

The significant differences between the performance of the learners with RWD and their typically developing matched peers indicated the validity of the measures used and that there was no evidence of discrimination against a distinctive cultural and linguistic sample of Mauritian learners. Figure 6.1 provides a summary of the main results of the three studies that comprised the research project.

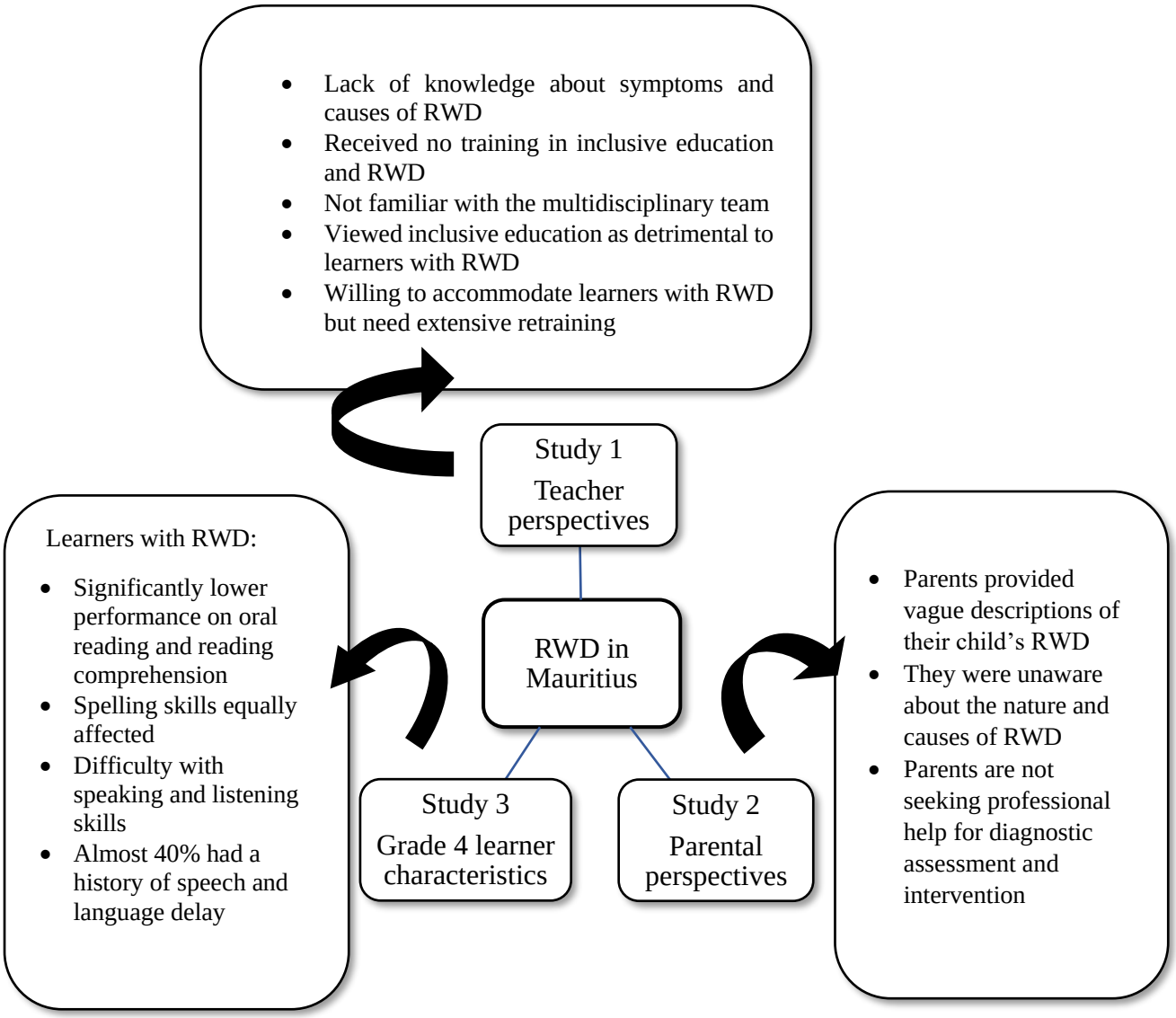


Figure 6. 1 Summary of the main results of the three studies

6.3 Implications of the study

The research study was a first attempt to highlight several dimensions of learners with RWD in Mauritius. A number of implications became clear.

Teachers' perspectives on learners with RWD in mainstream government schools revealed valuable information about the current knowledge of teachers on how to manage such learners in regular classrooms. Training of teachers about inclusive education teaching strategies should increase their confidence in identification of learners with RWD and teaching practices, thereby encouraging them to create more engaging learning environments for learners with difficulties (Bell, 2011; Gwernan-Jones & Burden, 2010; Washburn et al., 2017). Continuous in-service training in understanding RWD and inclusive education should be conducted in mainstream primary schools. These topics should also be included in the curriculum of future teachers in Mauritius.

The findings of Study 1 showed that the working conditions of teachers in an inclusive education setting should be more realistic. Improvements may include a reduced teacher-student ratio, access to adapted teaching and learning tools, provision for follow-up of progress in reading and writing skills and services from professionals such as SLTs. The findings also support multidisciplinary team involvement, including professionals such as SLTs, educational psychologists, occupational therapists and education personnel like mainstream teachers and special education teachers. Such a team should collaborate to support learners with RWD and their parents (Ross, 2020).

The needs of parents evident in Study 2 should also be addressed with team collaboration. Parents need to be made aware of their child's difficulties and the different intervention options available for their child to develop their reading and writing skills. Such a collaboration may promote early identification and diagnosis of learners with specific learning disorder, conditions which may underlie inattentive behaviour, developmental language disorder, or impaired cognitive processing in the early grades (Hayes et al., 2018). SLTs are responsible for the development of literacy for learners with communication disorders as the connection between spoken and written language is well established (Navas et al., 2017). Hence, SLTs should be given the opportunity to train teachers to implement specific teaching strategies, adjust the curriculum and provide intervention programs for learners with RWD in an inclusive education setting (Hogan, 2018). The characteristics of Grade 4 learners with RWD in Study 3 showed that they have moderate to severe RWD. There is an urgency to act and implement a specific literacy intervention program to develop the basic ability to read and write.

The findings of this research study need to be presented to the Ministry of Education, Tertiary Education, Science and Technology as evidence of the needs of learners with RWD, teachers and parents in Mauritius. Research evidence may assist to facilitate the implementation of inclusive education for learners with RWD.

6.4 Recommendations for accommodating learners with reading and writing difficulties in inclusive education

Figure 6.2 presents a proposal for a literacy intervention program to accommodate learners with RWD which can be implemented as part of the existing inclusive education framework in Mauritius (Ministry of Education and Human Resources, 2017). It is also recommended that this program be extended and formalised to include learners already diagnosed with specific learning disorder in SEN schools as well.

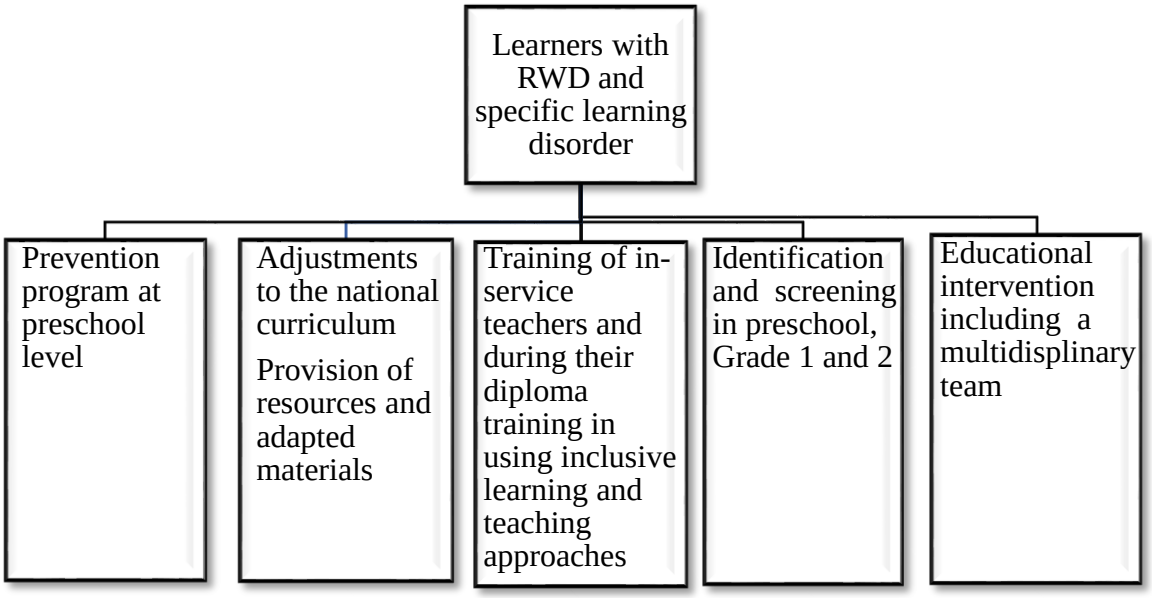


Figure 6. 2 Formal literacy intervention program for learners with RWD

Currently, there is no formal literacy intervention programme for learners with RWD that involves professionals such as SLTs, occupational therapists, and educational psychologists as well as teachers and the Department of Primary Education. Such a programme can help to develop or consolidate reading and writing skills which will facilitate learning and access to the national curriculum (Montgomery, 2020). A prevention program, promoting phonological awareness and other emergent literacy skills at home and in preschools, in Mauritian Creole

and in English or French could have a positive effect on the number of learners presenting with RWD during the primary level of education. All preschool and school learners should benefit from a well-planned literacy program which targets phonological awareness more intensively as well as letter and word recognition, fine motor control and co-ordination, and communication skills and language enrichment (Breadmore et al., 2019).

The curriculum should focus on developing foundations of literacy and building learners' language skills from pre-primary education onwards. The curriculum should be flexible to include a range of teaching approaches which integrates language, auditory processing and the visual-motor components of reading, spelling, and writing (Breadmore et al., 2019). Deloading the curriculum which was already included in the 2006 document of inclusive education must be further developed and implemented (Ministry of Education & Human Resources, 2006). The option for language exemption, where the learner only study through medium English rather than including French or any other of the Asian languages might be beneficial to optimise and ensure more effective learning in learners with RWD.

It is very important that teachers are trained to gain knowledge and confidence in the use of appropriate learning and teaching approaches for learners with RWD (Leifler, 2020). Evidence-based learning and teaching approaches for RWD include small group and one-to-one teaching (Ahmad et al., 2018). These includes methods like reciprocal teaching where the students become the teacher during instructional activity, small-group reading sessions, and scaffolding strategies where a teacher adds supports for the learner to enhance learning and help in the mastery of tasks (Hovland, 2020). Metacognitive approaches should be used to teach learners how to think and how they approach learning (Usman et al., 2017). The use of multi-sensory teaching is also very important and effective to implement the use of synthetic phonics and structured phonics programmes which teaches sounds within spoken words and intensive phonological awareness programs. These approaches should encompass paired reading with peers, paired reading with parents, accommodating the learner's preferred learning style, and use of information and communication technology to support learning experiences of learners identified with RWD (Al Otaiba et al., 2018).

Within the literacy intervention program, an identification process for the early detection of RWD should be conducted at pre-schools, and Grade 1 and 2. Preschool screening would involve identifying risks for RWD, such as developmental language disorder. This can lead to addressing learning needs of learners at an early stage. The emphasis at this stage is on preventing later difficulties rather than labelling learners prematurely. Screening at primary

level should initially be conducted for all grades so that all learners with RWD who are currently in the education system can be identified. Learners with RWD can be identified using the STLD by Vidyadharan et al. (2017), which has now been shown to be appropriate for use in Mauritius. The screening of learners with signs of RWD will provide a starting point for implementing the literacy intervention program with appropriate means of monitoring and recording pupils' progress.

The referral procedure to access therapeutic interventions once a learner has been identified with RWD should be accessible to teachers. A phonological awareness screening initiative will enable teachers of Grade 1 classes to identify learners who are at risk of RWD. Teachers can then be expected to monitor the progress of at-risk learners rigorously and provide them with curricular support in class or in small groups. Learners with RWD should first be diagnosed, followed by developing Individual Education Plans for each learner with RWD in collaboration SLTs and occupational therapists (Shah et al., 2019). A multi-disciplinary consultative approach to the identification and assessment of RWD should be piloted to evaluate the efficacy and validity of identification and intervention programs, both at preschool and primary level of education. (Shah et al., 2019). The literacy intervention program should involve various stakeholders. Strategies should be developed to encourage parents to be involved in their children's learning. The program should include procedures for communicating with parents about the learner's academic progress. Schools should employ ongoing literacy monitoring to track learners' academic progress.

6.5 Study strengths and limitations

Study strengths

To the researcher's knowledge, this is the first research of its kind in Mauritius. Teacher and parental perspectives about RWD in learners are valuable and need to be shared with teachers, SLTs and the Ministry of Education, Tertiary Education, Science and Technology. The questionnaires developed to investigate the perspectives of teachers and parents can be used in follow-up research to track changes in perspectives of teachers and parents after implementation of inclusive education for learners with RWD in Mauritius. Another strength of the three studies was the sample sizes. The samples for all three studies were substantial and included a fair distribution of urban and rural areas, indicating that the findings may be generalised to teachers, parents, and Grade 4 learners with RWD in Mauritian mainstream government schools.

The study is important for SLTs working in the education system. There is a dire need to implement a formal literacy intervention program for learners with RWD in Mauritian schools. By implementing classroom strategies and training teachers, less individual therapy with learners with RWD will be required, thereby utilising the limited number of SLTs more effectively in Mauritius. SLTs are also uniquely qualified to develop programs for the prevention of factors that contribute specific learning disorder, addressing speech and language delays in early intervention and promoting emergent literacy.

Study limitations

Certain limitations of the present research study have been identified. The teacher survey questionnaire used in the study could have included more questions about inclusive education for learners with RWD. The parent questionnaire lacked questions that could have explored parental emotions about their child's difficulties and their self-perceived needs. Furthermore, the multi-lingual environments of participants, their proficiency in the language of learning and teaching, and their home literacy environments were not investigated. There were also no developmental histories of the aged-matched learners without RWD available to make comparisons between the groups. Not investigating parent and children's socio-economic status was another limitation of the study. The limitations indicate future research priorities.

6.6 Recommendations for future research

More research should be conducted to investigate the perspectives of school principals and administrators in the Ministry, multidisciplinary team members and support teachers who are responsible for remedial classes in Grade 1 and 2 regarding learners with RWD. These stakeholders are important sources of information to gauge readiness for change. The research will provide more evidence for policy makers on how to fast track the implementation of inclusive education for learners with RWD in Mauritius. A survey conducted by the Ministry, investigating the extent and prevalence of RWD among learners in schools will provide data for future planning. Future research should investigate parental recommendations on how the education system in Mauritius could support families of learners with RWD in schools. Research should also investigate the influence of a mismatch between the child's home language and the language of learning and teaching in Mauritius. The present study did not

focus on investigating dyscalculia among learners in primary schools but should be included in future research.

6.7 Conclusion

In conclusion, although Mauritius has adopted an inclusive education policy, it has not been implemented yet. Most learners experiencing RWD are taught in regular classrooms in mainstream schools without the benefit of adapted materials and teaching strategies that meet their individual learning needs. Teachers' and parents' lack of knowledge and misconceptions about learners with RWD may be addressed by training and awareness programs.

The current study provided valuable data which can be used by the Ministry to focus on the significant challenges of learners with RWD, their families and teachers. The characteristics of learners with RWD revealed by screening and assessment outcomes showed that they are not benefiting from current teaching methods and that they have significant challenges to meet the demands of the national curriculum. Effective and efficient education involves education delivered to all learners according to their different learning styles and diverse learning difficulties (Cabual, 2021). The implementation of such an education approach relies on a particular framework based on the synthesis of research results (Cho et al., 2021). The findings of the current study could guide practitioners and policymakers to develop an effective evidence-based literacy intervention program in Mauritius.

REFERENCES

Abbott, R.D., Berninger, V.W., & Fayol, M. (2010). Longitudinal relationships of levels of language in writing and between writing and reading in grades 1 to 7. *Journal of Educational Psychology, 102*(2), 281–298. https://doi.org/10.1037/a0019318

Adewumi, T.M., & Mosito, C. (2019). Experiences of teachers in implementing inclusion of learners with special education needs in selected Fort Beaufort District primary schools, South Africa. *Cogent Education, 6*(1), 1-20. https://doi.org/10.1080/2331186X.2019.1703446

Adlof, S.M., Scoggins, J., Brazendale, A., Babb, S., & Petscher, Y. (2017). Identifying children at risk for language impairment or dyslexia with group-administered measures. *Journal of Speech, Language, and Hearing Research, 60*(12), 3507–3522. https://doi.org/10.1044/2017_JSLHR-L-16-0473.

Adlof, S. M., & Hogan, T. P. (2018). Understanding dyslexia in the context of developmental language disorders. *Language, Speech, and Hearing Services in Schools, 49*(4), 762-773. https://doi.org/10.1044/2018_LSHSS-DYSLC-18-0049

Adubasim, I. (2018). Improving working memory and processing speed of students with dyslexia in Nigeria. *Journal of Education & Entrepreneurship, 5*(2), 103-123. doi: 10.26762/jee.2018.40000017

Agrawal, J., Barrio, B.L., Kressler, B., Hsiao, Y.J., & Shankland, R.K. (2019). International policies, identification, and services for students with learning disabilities: An exploration across 10 countries. *Learning Disabilities: A Contemporary Journal, 17*(1), 95-113. https://files.eric.ed.gov/ fulltext/EJ1218057.pdf

Ahmad, S., Ali, M., & Salehuddin, K. (2018). ESL Teachers' experience in teaching pupils with dyslexia in mainstream classrooms. *Creative Education*, 9, 2171-2182. doi: 10.4236/ce.2018.914158.

Alahmadi, N.A., & El Keshky, M.E.S. (2019). Assessing primary school teachers' knowledge of specific learning disabilities in the Kingdom of Saudi Arabia. *Journal of Educational and Developmental Psychology*, 9(1), 9-22. DOI:10.5539/jedp.v9n1p9

Alawadh, A. (2016). *Teachers' perceptions of the challenges related to provision of services for learners with specific learning difficulties (dyslexia) in Kuwaiti government primary schools.* Doctoral dissertation, University of York. Retrieved from http://etheses.whiterose.ac.uk/id/eprint/17437

Alkahtani, M.A., & Kheirallah, S.A. (2016). Background of individual education plans (IEPs) policy in some countries: A review. *Journal of Education and Practice, 7*(24), 15-26. https://files.eric.ed.gov/fulltext/ EJ1112737.pdf

Allen, M.H., Matthews, C.E., & Parsons, S.A. (2013). A second-grade teacher's adaptive teaching during an integrated science-literacy unit. *Teaching and Teacher Education, 35,* 114-125. DOI: 10.1016/j.tate.2013.06.002

Alnaim, F. (2015). Learning disabilities concept and identification: Primary teachers' perspectives in Saudi Arabia. *International Journal of Social Science and Humanity,* 5(12), 1040-1050. DOI: 10.7763/IJSSH.2015.V5.601

Al Otaiba, S., Rouse, A.G., & Baker, K. (2018). Elementary grade intervention approaches to treat specific learning disabilities, including dyslexia. *Language, Speech, and Hearing Services in Schools, 49*(4), 829-842. https://doi.org/10.1044/2018_LSHSS-DYSLC-18-0022

Altinkaynak, S.Ö. (2019). The effect of interactive book reading activities on children's print and phonemic awareness skills. *International Journal of Progressive Education, 15*(1), 88-99. DOI: 10.29329/ijpe.2019.184.6

Alt, M., Hogan, T., Green, S., Gray, S., Cabbage, K., & Cowan, N. (2017). Word learning deficits in children with dyslexia. *Journal of Speech, Language, and Hearing Research, 60*(4), 1012–1028. https://doi.org/10.1044/2016_JSLHR-L-16-0036

Amendum, S.J., Vernon-Feagans, L., & Ginsberg, M.C. (2011). The effectiveness of a technologically facilitated classroom-based early reading intervention: The targeted reading intervention. *The Elementary School Journal, 112*(1), 107-131. https://doi.org/10.1086/660684

American Psychiatric Association [APA]. (2013). *Diagnostic and statistical manual of mental disorders,* 5th edition *(DSM-5),* American Psychiatric Association.

American Speech-Language-Hearing Association [ASHA]. (2001). *Roles and responsibilities of speech-language pathologists with respect to reading and writing in children and adolescents [Position statement]*. http://www.asha.org/policy

ASHA. (2016). *Scope of practice in speech-language pathology* [Scope of Practice]. Available from www.asha.org/policy/.

Ateş, S., Yildirim, K., & Yildiz, M. (2010). Opinions of classroom teachers and prospective classroom teachers about the learning difficulties encountered in the teaching process of reading and writing. *Elementary Education Online, 9*(1), 44-51. https://www.researchgate.net/publication/265404677

Austin, C.R., & Vaughn, S. (2016). Reading interventions for young learners with reading difficulties and disabilities: The role of word reading and word meaning. *Special Education for Young Learners with Disabilities. Advances in Special Education, 34,* 15-37. https://doi.org/10.1108/S0270-401320190000034002

Austin, C.R. & Vaughn, S. (2019), "Reading Interventions for Young Learners with Reading Difficulties and Disabilities: The Role of Word Reading and Word Meaning", *Special Education for Young Learners with Disabilities, 34,*15-37. https://doi.org/10.1108/S0270-401320190000034002

Axelsson, A., Lundqvist, J., & Sandberg, G. (2020). Influential factors on children's reading and writing development: The perspective of parents in a Swedish context. *Early Child Development and Care, 190* (16), 2520-2532. https://doi.org/10.1080/03004430.2019.1590348

Barton-Hulsey, A., Sevcik, R.A., & Romski, M. (2018). The relationship between speech, language, and phonological awareness in preschool-age children with developmental disabilities. *American Journal of Speech-Language Pathology, 27*(2), 616–632. https://doi.org/10.1044/2017_AJSLP-17-0066

Beacham, N., & Rouse, M. (2012). Student teachers' attitudes and beliefs about inclusion and inclusive practice. *Journal of Research in Special Educational Needs*, *12*(1), 3-11. DOI:10.1111/j.1471-3802.2010.01194.x

Bell, S., McPhillips, T., & Doveston, M. (2011). How do teachers in Ireland and England conceptualise dyslexia? *Journal of Research in Reading, 34*(2), 171-192. DOI: 192.10.1111/j.1467-9817.2009.01419.x

Bhatnagar, N., & Das, A. (2014). Regular school teachers' concerns and perceived barriers to implement inclusive education in New Delhi, India. *International Journal of Instruction, 7*(2), 89-102. https://files.eric.ed.gov/fulltext/EJ1085257.pdf

Bird, R. (2017). The dyscalculia toolkit: Supporting learning difficulties in maths, 3rd edition. SAGE Publications Ltd.

Boros, M., Anton, J.L., Pech-Georgel, C., Grainger, J., Szwed, M., & Ziegler, J. C. (2016). Orthographic processing deficits in developmental dyslexia: Beyond the ventral visual stream. *NeuroImage, 128*, 316–327. DOI: 10.1016/j.neuroimage.2016.01.014

Breadmore, H.L., Vardy, E.J., Cunningham, A.J., Kwok, R.K.W., & Carroll, J.M. (2019). *Literacy development: Evidence review*. Education Endowment Foundation. https://educationendowmentfoundation.org.uk/public/files/Literacy_Development_Evidence_ Review.pdf

Cabual, R.A. (2021) Learning Styles and Preferred Learning Modalities in the New Normal. *Open Access Library Journal*, **8**, 1-14. doi: 10.4236/oalib.1107305.

Caglar-Ryeng, Ø., Eklund, K., & Nergård-Nilssen, T. (2020). The effects of book exposure and reading interest on oral language skills of children with and without a familial risk of dyslexia. *Dyslexia, 26*(4), 394-410. https://doi.org/10.1002/dys.1657

Campbell, W., Selkirk, E., & Gaines, R. (2016). Speech-language pathologists' role in inclusive education: A survey of clinicians' perceptions of universal design for learning. *Canadian Journal of Speech-Language Pathology and Audiology (CJSLPA)*, 122-128. https://files.eric.ed.gov/fulltext/EJ1085257.pdf

Cao, F., Yan, X., Spray, G.J., Liu, Y., & Deng, Y. (2018). Brain mechanisms underlying visuo-orthographic deficits in children with developmental dyslexia. *Frontiers in Human Neuroscience, 12*, 490-503. DOI: 10.3389/fnhum.2018.00490

Castro, D.A.S., & Barrera, S.D. (2019). The contribution of emergent literacy skills for early reading and writing achievement. *Trends in Psychology*, *27*, 509-522. http://dx.doi.org/10.9788/TP2019.2-15

Cavalli, E., Duncan, L. G., Elbro, C., El Ahmadi, A., and Colé, P. (2017). Phonemic-Morphemic dissociation in university students with dyslexia: an index of reading compensation? Ann. Dyslexia 67, 63–84. doi: 10.1007/s11881-016-0138-y

Cavioni, V., Grazzani, I. & Ornaghi, V., 2017, Social and emotional learning for children with Learning Disability: Implications for inclusion. *International Journal of Emotional Education*, 9(2), pp.100-109. Retrieved from EJ1162075. pdf (ed.gov)

Centanni, T.M., Anchan, D.M., Beard, M., Brooks, R., Thompson, L.A., & Petrill, S.A. (2019). Genetic and environmental influences on decoding skills – implications for music and reading. *Front. Psychol. 10*, 2604-2613. DOI: 10.3389/fpsyg.2019.02604

Chandramuki, D., Venkatakrishnashastry, I., & Vranda, M.N. (2012). Attitudes of parents towards children with specific learning disabilities. *Disability, CBR & Inclusive Development*, *23*(1), 63-69. DOI:10.5463/DCID.v23i1.47

Chien, W.T., & Lee I.Y. (2013). An exploratory study of parents perceived educational needs for parenting a child with learning disabilities. *Asian Nurs Res, 7* (1), 16-25. doi:10.1016/j.anr.2013.01.003

Chimire, S. (2017). Knowledge of primary school teacher regarding learning disabilities in school children. *Journal of Nobel Medical College*, *6*(1), 29-35. DOI:10.3126/jonmc.v6i1.18084

Chmilar, L. (2016). Improving the spelling skills of students with learning disabilities using apps on the iPad. *International Journal of Technology and Inclusive Education*, *3*(1), 962 -972. https://infonomics-society.org/wp-content/uploads/ijtie/published-papers/special-issue-volume-3-2016/Improving-the-Spelling-Skills-of-Students-with-Learning-Disabilities-using-Apps-on-the-iPad-1.pdf

Cho, Y., Kim, D., & Jeong, S. (2021). Evidence-based reading interventions for English language learners: A multilevel meta-analysis. *Heliyon*, *7*(1), e07985. https://doi.org/10.1016/j.heliyon.2021.e07985

Chyl, K., Kossowski, B., Wang, S., Dębska, A., Łuniewska, M., Marchewka, A., Wypych, M., Bunt, M.V. D., Mencl, W., Pugh, K., & Jednoróg, K. (2021). The brain signature of emerging reading in two contrasting languages. *Neuroimage, 15* (2), 1-38. DOI: 10.1016/j.neuroimage.2020.117503.

Cidrim, L., & Madeiro, F. (2017). Studies on spelling in the context of dyslexia: A literature review. *Revista CEFAC, 19*, 842-854. DOI: 10.1590/1982-0216201719610317

Cortiella, C., & Horowitz, S.H. (2014). The state of learning disabilities: Facts, trends and emerging issues. *National Center for Learning Disabilities*, *25*, 2-45.

Costello, S., & Boyle, C. (2013). Pre-service secondary teachers' attitudes towards inclusive education. *Australian Journal of Teacher Education, 38*(4), 129–143. http://ro.ecu.edu.au/ajte/vol38/iss4/8.

Craig, H.K., Thompson, C.A., Washington, J.A., & Potter, S.L. (2004). Performance of elementary-grade African American students on the Gray Oral Reading Tests. *Language, Speech, and Hearing Services in Schools, 35*(2), 141-154. https://doi.org/10.1044/0161-1461(2004/015)

Creswell, J.W., & Creswell, J.D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.

Cretu, D.M., & Morandau, F. (2020). Initial teacher education for inclusive education: A bibliometric analysis of educational research. *Sustainability, 12*(12), 4923-4929. DOI:10.3390/su12124923

Dapudong, R.C. (2014). Teachers' knowledge and attitude towards inclusive education: Basis for an enhanced professional development program. *International Journal of Learning & Development*, *4*(4), 1-24. DOI:10.5296/ijld.v4i4.6116

Darling-Hammond, L., Flook, L., Cook-Harvey, C., Barron, B., & Osher, D. (2020). Implications for educational practice of the science of learning and development. *Applied Developmental Science*, *24*(2), 97-140. https://doi.org/10.1080/10888691.2018.1537791

Debata, P., Kumar, J., & Mukhopadhyay, K. (2019). Screening for language delay between 6 months and 3 years of corrected age in very low birth weight children. *Indian Pediatr, 56*, 481–484. https://doi.org/10.1007/s13312-019-1573-8

De Boer, A., Pijl, S.J., & Minnaert, A. (2011). Regular primary schoolteachers' attitudes towards inclusive education: A review of the literature. *International Journal of Inclusive Education*, 15(3), 331-353. DOI: 10.1080/13603110903030089

Delany, K. (2017). The experience of parenting a child with dyslexia: An Australian perspective. *Journal of Student Engagement: Education Matters*, *7*(1), 97-123. http://ro.uow.edu.au/jseem/vol7/iss1/6

Del Tufo, S.N., Earle, F.S., & Cutting, L.E. (2019). The impact of expressive language development and the left inferior longitudinal fasciculus on listening and reading comprehension. *J Neurodevelop Disord 11***,** 37-64. https://doi.org/10.1186/s11689-019-9296-7.

Deva, S., & Kumar, J. (2015). Teacher's perception towards integration of learning disabled students into regular class room–a study in Dubai & Abu Dhabi Schools. *Procedia-Social and Behavioral Sciences, 2*(11), 605-611.DOI: 10.1016/j.sbspro.2015.11.079

Dilnot, J., Hamilton, L., Maughan, B., & Snowling, M. (2017). Child and environmental risk factors predicting readiness for learning in children at high risk of dyslexia. *Development and Psychopathology, 29*(1), 235-244. DOI:10.1017/S0954579416000134

Dong, Y., Wu, S.X.Y., Dong, W.Y., & Tang, Y. (2020). The effects of home literacy environment on children's reading comprehension development: A meta-analysis. *Educational Sciences: Theory and Practice*, *20*(2), 63-82. DOI: 10.12738/jestp.2020.2.005

Dresler, T., Bugden, S., Gouet, C., Lallier, M., Oliveira, D.G., Pinheiro-Chagas, P., Pires, A. C., Wang, Y., Zugarramurdi, C., & Weissheimer, J. (2018). A translational framework of educational neuroscience in learning disorders. *Frontiers in Integrative Neuroscience*, *12*, 25-36. https://doi.org/10.3389/fnint.2018.0002

Dyslexia International (2014). Better training, better teaching. *Dyslexia International*, Brussels. http://www.dyslexia-international.org/wp-content/uploads/2014/10/DIReport-final-429-14.pdf

Education statistics-2020 of Republic of Mauritius, 2018, Retrieved from http://statsmauritius.govmu.org/English/Publications/Documents/EI1337/Edu_Yr17.pdf

Esmaeeli, Z., Kyle, F.E. & Lundetræ, K. Contribution of family risk, emergent literacy and environmental protective factors in children's reading difficulties at the end of second-grade. *Read Writ* **32,** 2375–2399 (2019). https://doi.org/10.1007/s11145-019-09948-5

Essa, H.A., & El-Zeftawy, A.M.A. (2015). Teachers' knowledge, attitudes and reported strategies to assess and support the students with learning difficulties. *Journal of Nursing and Health Science, 4*(2), 79-92. DOI: 10.9790/1959-04227992

Eyo, M. & Nkanga, E. (2020). Teachers' competence in identifying pupils with learning disabilities: A study in Nigerian primary schools. *Issues in Educational Research*, 30(3), 883-896. http://www.iier.org.au/iier30/eyo.pdf

Faragher, R., Chen, M., Miranda, L., Poon, K., Chang, F.R., & Chen, H. (2021). Inclusive education in Asia: Insights from some country case studies. *Journal of Policy and Practice in Intellectual Disabilities*, *18*(1), 23-35. DOI: 10.1111/jppi.12369

Fernandez, N., & Hynes, J. (2016). The efficacy of pull-out programs in elementary schools: Making it work. *The Journal of Multidisciplinary Graduate Research*, *2*(3), 32-47. https://www.shsu.edu/academics/education/journal-of-multidisciplinary-graduate-research

Fienup, D.M., Reyes-Giordano, K., Wolosik, K., Aghjayan, A., & Chacko, A. (2015). Brief experimental analysis of reading deficits for children with attention-deficit/hyperactivity disorder. *Behavior Modification*, *39*(1), 191-214. DOI: 10.1177/0145445514550393

Findler, L., Jacoby, A.K., & Gabis, L. (2016). Subjective happiness among mothers of children with disabilities: The role of stress, attachment, guilt, and social support. *Research in Developmental Disabilities*, *55*(1), 44–54. DOI:10.1016 /j.ridd.2016.03.006

Fletcher, J.M., & Grigorenko, E.L. (2017). Neuropsychology of learning disabilities: the past and the future. *Journal of the International Neuropsychological Society, 23*(9), 930–940. https://doi.org/10.1017/S1355617717001084

Fletcher. J.M., Lyon, G.R., Fuchs, L.S., & Barnes, M.A. (2018). *Learning disabilities: From identification to intervention,* 2nd edition. Guilford Press.

Florian, L. (2012). Preparing teachers to work in inclusive classrooms: Key lessons for the professional development of teacher educators from Scotland's inclusive practice project. *Journal of Teacher Education,* 63(4), 275-285. https://doi.org/10.1177/0022487112447112

Gamero Burón, C., & Lassibille, G. (2016). Job satisfaction among primary school personnel in Madagascar. *The Journal of Development Studies*, *52*(11), 1628-1646. DOI: 10.1080/00220388.2016.1187726

Gandhimathi, U., & Eljo, J.O. (2010). Awareness about learning disabilities among the primary school teachers. *Cauvery Research Journal*, *3*(1), 71-78. http://cauverycollege.ac.in/Admin/FileFolder/Journals/77.pdf

Garbe, A., Ogurlu, U., Logan, N., & Cook, P. (2020). Parents' experiences with remote education during COVID-19 school closures. *American Journal of Qualitative Research*, *4*(3), 45-65. DOI:10.29333/ajqr/8471

Giacovazzi, L., Moonsamy, S., & Mophosho, M. (2021). Promoting emergent literacy in under-served preschools using environmental print. *The South African Journal of Communication Disorders*, *68*(1), 1–11. https://doi.org/10.4102/sajcd.v68i1.809

Gillon, G., McNeill, B., Scott, A., Denston, A., Wilson, L., Carson, K., & Macfarlane, A.H. (2019). A better start to literacy learning: Findings from a teacher-implemented intervention in children's first year at school. *Reading and Writing*, *32*(8), 1989-2012. https://doi.org/10.1007/s11145-018-9933-7

Gillon, G., & Macfarlane, A.H. (2017). A culturally responsive framework for enhancing phonological awareness development in children with speech and language impairment. *Speech, Language and Hearing*, *20*(3), 163-173. https://doi.org/10.1080/2050571X.2016.1265738

Gindrich, P.A., & Kazanowski, Z. (2017). The creative potential and self-reported learning disabilities of polish university students who major in special education. *SAGE Open, 7*(1), 1-12. https://doi.org/10.1177/2158244016689128

Gonçalves, T.D.S., & Crenitte, P.A. (2014). conceptions of elementary school teachers about learning disorders. *Revista CEFAC, 16*(3), 817-829. DOI:10.1590/19820216201427312

Glezer LS, Jiang X, Luetje MM, Napoliello EM, Kim J, Riesenhuber M, Eden GF. 2019. An fMRI-adaptation study of phonological and orthographic selectivity to written words in adults with poor reading skills. Brain and Language 191: 1–8. DOI: https://doi.org/10.1016/j.bandl.2019.01.002

Glover, A., McCormack, J., & Smith-Tamaray, M. (2015). Collaboration between teachers and speech and language therapists: Services for primary school children with speech, language and communication needs. *Child Language Teaching and Therapy*, *31*(3), 363-382. https://doi.org/10.1177/0265659015603779

Görker, I., Bozatli, L., Korkmazlar, Ü., Yücel Karadağ, M., Ceylan, C., Söğüt, C., Aykutlu, H. C., Subay, B., & Turan, N. (2017). The probable prevalence and sociodemographic characteristics of specific learning disorder in primary school children in Edirne. *Noro Psikiyatri Arsivi*, *54*(4), 343–349. https://doi.org/10.5152/npa.2016.18054

Guo, Y., Puranik, C., Kelcey, B., Sun, J., Dinnesen, M.S., & Breit-Smith, A. (2021). The role of home literacy practices in kindergarten children's early writing development: A one-year longitudinal study. *Early Education and Development, 32*(2), 209-227. DOI:10.1080/10409289.2020.1746618

Gündogmus, H.D. (2018). The difficulties experienced by teachers in the process of primary reading and writing instruction and their solution offers for eliminating these difficulties. *Universal Journal of Educational Research, 6*(2), 333-339. DOI: 10.13189/ujer.2018.060216

Gwernan-Jones, R., & Burden, R.L. (2010). Are they just lazy? Student teachers' attitudes about dyslexia. *Dyslexia*, *16*(1), 66-86. DOI: 10.1002/dys.393

Győrfi, A., & Smythe, I. (2010). Dyslexia in Europe: A pan-European survey. *BF Systems, Budapest*. http://doitprofiler.info/media/13299/dyslexia_report_2010_final_mep.pdf

Haft, S.L., Myers, C.A., & Hoeft, F. (2016). Socio-emotional and cognitive resilience in children with reading disabilities. *Current Opinion in Behavioral Sciences, 10*(1), 133-141. DOI:10.1016/ j.cobeha.2016.06.005

Hamilton, L.G., Hayiou-Thomas, M.E., Hulme, C., & Snowling, M.J. (2016). The home literacy environment as a predictor of the early literacy development of children at family-risk of dyslexia. *Scientific Studies of Reading, 20*(5), 401–419. https://doi.org/10.1080/10888438.2016.1213266

Hanley, J.R., & Sotiropoulos, A. (2018). Developmental surface dysgraphia without surface dyslexia. *Cognitive Neuropsychology, 35* (5-6), 333-341. https://doi.org/10.1080/02643294.2018.1468317

Hayes, A.M., & Bulat, J. (2018). Disabilities inclusive education systems and policies guide for low- and middle-income countries. RTI Press Publication No. OP-0043-1707. Research Triangle Park, NC: RTI Press. https://doi.org/10.3768/rtipress.2017.op.0043.1707

Hebert, M., Kearns, D.M., Hayes, J.B., Bazis, P., & Cooper, S. (2018). Why children with dyslexia struggle with writing and how to help them. *Language, Speech, and Hearing Services in Schools*, *49*(4), 843–863. https://doi.org/10.1044/2018_LSHSS-DYSLC-18-0024

Hemmerechts, K., Agirdag, O., & Kavadias, D. (2017). The relationship between parental literacy involvement, socio-economic status and reading literacy. *Educational Review, 69*(1), 85-101. DOI: 10.1080/00131911.2016.1164667

Henrique, M.R., & Madeira, M.L. (2017). Reading and writing: Learning difficulties, causes and teacher's intervention. *Literacy Information and Computer Education Journal, 8*(1), 2489-2496.https://infonomics-society.org/wp-content/uploads/licej/published-papers/volume-8-2017/Reading-and-Writing-Learning-Difficulties-Causes-and-Teachers-Intervention-3.pdf

Hepner, C., McCloskey, M., & Rapp, B. (2017). Do reading and spelling share orthographic representations? Evidence from developmental dysgraphia. *Cognitive Neuropsychology, 34*(3), 119–143. https://doi.org/10.1080/02643294.2017.1375904

Hettiaarachi, S., Ranaweera, M., Walisundara, D., Daston-Attanayake, L., & Das, A.K. (2018). Including all? Perceptions of mainstream teachers on inclusive education in the western province of Sri Lanka. *International Journal of Special Education, 33*(2), 427-447. https://eric.ed.gov/?id=EJ1185612

Hofslundsengen, H., Gustafsson, J.E., & Hagtvet, B.E. (2019). Contributions of the home literacy environment and underlying language skills to preschool invented writing. *Scandinavian Journal of Educational Research, 63*(5), 653-669. DOI:10.1080/00313831.2017.1420686

Hogan, T. (2018). Five ways speech-language pathologists can positively impact children with dyslexia. *Language, Speech and Hearing Services in Schools, 49*(1) 902–905. https://doi.org/10.1044/2018_LSHSS-DYSLC-18-0102

Hollenweger, J. (2011). Teachers' ability to assess students for teaching and supporting learning. *Prospects, 41*(3), 445-457. DOI:10.1007/s11125-011-9197-3

Holmes, J., & Dunning, D.L. (2017). Improving working memory to enhance maths performance. In J. Adams, P. Barmby, & A. Mesoudi (Eds.), *The nature and development of mathematics: Cross-disciplinary perspectives on cognition, learning and culture.* Routledge, Taylor Francis Group.

Hoof, J.V., Verschaffel, L., Ghesquiere, P. &Dooren, W.V. (2017). The natural number bias and its role in rational number understanding in children with dyscalculia. Delay or deficit? *Research in Developmental Disabilities, 71,* 181-190. http://dx.doi.org/10.1016/j.ridd.2017.10.006

Horowitz-Kraus, T., Schmitz, R., Hutton, J.S., & Schumacher, J. (2017). How to create a successful reader? Milestones in reading development from birth to adolescence. *Acta Paediatrica, 106*(4), 534-544. DOI: 10.1111/apa.13738

Hovland, J.B. (2020). Inclusive comprehension strategy instruction: Reciprocal teaching and adolescents with intellectual disability. *TEACHING Exceptional Children, 52*(6), 404-413. https://doi.org/10.1177/0040059920914334

Haug, P. (2017). Understanding inclusive education: Ideals and reality. *Scandinavian Journal of Disability Research,* 19(3), pp.206–217.
DOI: http://doi.org/10.1080/15017419.2016.1224778

Huang, Y., He, M., Li, A., Lin, Y., Zhang, X., & Wu, K. (2020). Personality, behavior characteristics, and life quality impact of children with dyslexia. *International journal of environmental research and public health, 17*(4), 1415. DOI:10.3390/ijerph17041415

Indrarathne, B. (2019). Accommodating learners with specific learning difficulties in educational settings: Problems and solutions. *TESOL Quarterly, 53*(3), 630-654. DOI: 10.1002/tesq.500

Ismail, A. O., Mahmood, A. K., & Abdelmaboud, A. (2018). Factors Influencing Academic Performance of Students in Blended and Traditional Domains. *International Journal of Emerging Technologies in Learning*, *13*(2), 170-188. http://dx.doi.org/10.3991/ijet.v13i02.8031

Johney, A., Baby, A., Lukose, A.M., Philip, A., Josephine, E., Joseph, T., Ebnezar, J.N.P., & Manoj, P.S. (2015). To assess the knowledge of parents regarding childhood specific learning disabilities visiting a selected hospital at Mangalore. *Int J Health Sci Res, 5*(12), 268-273. DOI: 10.4103/IJPSYM.IJPSYM_148_18

Joshi, R.M., Washburn, E.K., & Kahn-Horwitz, J. (2016). Introduction to the special issue on teacher knowledge from an international perspective. *Annals of Dyslexia*, *66*(1), 1-6. DOI:10.1007/s11881-015-0119-6

Kafonogo, F.M., & Bali, T.A. (2013). Exploring classroom teachers' awareness of pupils with learning disabilities: Focusing on public primary schools in Tanzania. *Journal of Education and Practice, 4*(24), 58-66. https://iiste.org/Journals/index.php/JEP/article/view/8897/9171

Kalsoom, T., Mujahid, A. H., & Zulfqar, A. (2020). Dyslexia as a learning disability: Teachers' perceptions and practices at school level. *Bulletin of Education and Research*, *42*(1), 155-166. https://.eric.ed.gov/fulltext/EJ1258036.pdf

Kamala, R., & Ramganesh, E. (2013). Knowledge of specific learning disabilities among teacher educators in Puducherry, Union Territory in India. *International Review of Social Sciences and Humanities, 6*(1), 168-175. DOI: 10.5463/DCID.v26i3.443

Karande, S., & Kuril, S. (2011). Impact of parenting practices on parent–child relationships in children with specific learning disability. *Journal of Postgraduate Medicine, 57* (1), 20–30. DOI:10.4103/0022-3859.75344.

Kastamoniti, A., Tsattalios, K., Christodoulides, P., & Zakopoulou, V. (2018). The role of phonological memory in reading acquisition and dyslexia: A systematic literature review. *European Journal of Special Education Research, 3*(4), 278-323. DOI:10.5281/zenodo.1560698

Kathard, H., Ramma, L., Pascoe, M., Jordaan, H., Moonsamy, S., Wium, A.M., Du Plessis, S., Pottas, L., & Banu Khan, N. (2011). How can speech-language therapists and

audiologists enhance language and literacy outcomes in South Africa? (And why we urgently need to). *South African Journal of Communication Disorders, 58* (Special Edition), 1-8. DOI:10.7196/sajcd.84

Kavkler, M., Babuder, M.K., & Magajna, L. (2015). Inclusive education for children with specific learning difficulties: Analysis of opportunities and barriers in inclusive education in Slovenia. *Center for Educational Policy Studies Journal*, *5*(1), 31-52. https://d-nb.info/1081012633 /34

Kayabasi, Z.E.K. (2017). Views of classroom teachers concerning students with reading difficulties. *International Journal of Progressive Education*, *13*(3), 50-60. https://files.eric.ed.gov/fulltext/EJ1159913.pdf

Kim, Y.S.G., Lee, H., & Zuilkowski, S.S. (2020). Impact of literacy interventions on reading skills in low-and middle-income countries: A meta-analysis. *Child Development*, *91*(2), 638-660. https://doi.org/10.1111/cdev.13204

Kohli, A., Sharma, S., & Padhy, S.K. (2018). Specific learning disabilities: issues that remain unanswered. *Indian Journal of Psychological Medicine*, *40*(5), 399–405. https://doi.org/10.4103/IJPSYM.IJPSYM_86_18

Knight C. (2018). What is dyslexia? An exploration of the relationship between teachers' understandings of dyslexia and their training experiences. *Dyslexia*, *24*(3), 207–219. https://doi.org/10.1002/dys.1593

Kodiango, W.O., & Syomwene, A. (2016). Challenges faced by the hearing-impaired learners in composition writing and in answering comprehension questions in English language lessons. *European Journal of Education Studies*, *2*(10), 1-13. DOI:10.5281/zenodo.166048

Kormos, J., & Nijakowska, J. (2017). Inclusive practices in teaching students with dyslexia: Second language teachers' concerns, attitudes and self-efficacy beliefs on a massive open online learning course. *Teaching and Teacher Education*, *68*, 30-41. https://doi.org/10.1016/j.tate.2017.08.005

Kreitz, J. (2016). Identifying and supporting struggling readers. *BU Journal of Graduate Studies in Education, 8*(1), 25-28. https://files.eric.ed.gov/fulltext/EJ1230489.pdf

Krijnen, E., Van Steensel, R., Meeuwisse, M., & Severiens, S. (2021). Measuring parental literacy beliefs in a socio-economically, linguistically and ethnically diverse sample. *Early Education and Development*, *32*(4), 608-635. https://doi.org/10.1080/10409289.2020.1785227

Kronbichler, L., Kronbichler, M. (2018). The importance of the left occipitotemporal cortex in developmental dyslexia. *Curr Dev Disord Rep 5***,** 1–8. https://doi.org/10.1007/s40474-018-0135-4

Küçükünal, I.S., Özçelik, A.D.Ö., & Yalçınkaya, F. (2020). Teachers' opinions regarding the symptoms of central auditory processing disorder in children with reading and writing

difficulties. *South African Journal of Education, 40*(2), 1-9. https://doi.org/10.15700/saje.v40n2a1640

Kuerten, A.B., Mota, M.B., & Segaert, K. (2019). Developmental dyslexia: A condensed review of literature. *Ilha do Desterro, 72*(3), 249-270. https://doi.org/10.5007/2175-8026.2019v72n3p249

Kumar, R. (2018). *Research methodology: A step-by-step guide for beginners*. Sage.

Lau, C., & Richards, B. (2021). Home literacy environment and children's English language and literacy skills in Hong Kong. *Front. Psychol, 11*, 569-581. DOI: 10.3389/fpsyg.2020.569581

Law, J.M., De Vos, A., Vanderauwera, J., Wouters, J., Ghesquière, P., & Vandermosten, M. (2018). Grapheme-phoneme learning in an unknown orthography: A study in typical reading and dyslexic children. *Frontiers in Psychology, 9*, 1393-1403. https://doi.org/10.3389/fpsyg.2018.01393

Leedy, P.D., & Ormrod, J.E. (2014). *Practical research: Planning and design*, 10th edition. Pearson Education.

Leifler, E. (2020). Teachers' capacity to create inclusive learning environments, *International Journal for Lesson and Learning Studies, 9*(3), 221-244. https://doi.org/10.1108/IJLLS-01-2020-0003

Li, Z., & Qiu, Z. (2018). How does family background affect children's educational achievement? Evidence from contemporary China. *The Journal of Chinese Sociology, 5*(1), 1-21. https://doi.org/10.1186/s40711-018-0083-8

Lima, C.L., & Kuusisto, E. (2019). Parental engagement in children's learning: A holistic approach to teacher-parents' partnerships. *Pedagogy in basic and higher education. Current developments and challenges*. IntechOpen. DOI: 10.5772/intechopen.89841

Lindner, K.T., & Schwab, S. (2020). Differentiation and individualisation in inclusive education: A systematic review and narrative synthesis. *International Journal of Inclusive Education, 1*(1)1-21. DOI: 10.1080/13603116.2020.1813450

Lingeswaran A. (2013). Assessing knowledge of primary school teachers on specific learning disabilities in two schools in India. *Journal of Education and Health Promotion, 2*, 1-5. DOI:10.4103/2277-9531.115807

Lopes, R.C.F. & Crenitte, P.A.P. (2013). Analytical study of teachers' knowledge about learning disorders. *Revista CEFAC, 15*(5), 1214-1226. DOI:10.1590/S1516-18462012005000091

Lübke, L., Pinquart, M., & Schwinger, M. (2021). The role of flexibility in the realization of inclusive education. *Sustainability, 13*(8), 4452-4470. https://doi.org/10.3390/su13084452

Lüke, T. & Grosche, M. (2018). Implicitly measuring attitudes towards inclusive education: A new attitude test based on single-target implicit associations. *European Journal of*

Special Needs Education, 33(3), 427-436. https://doi.org/10.1080/08856257.2017.1334432

Lütje-Klose, B., & Urban, M. (2014). Professionelle kooperation als wesentliche bedingung inklusiver schul- und unterrichtsentwicklung, Teil 2: Forschungsergebnisse zu intra- und interprofessioneller kooperation. [Cooperation as an essential condition for inclusive education development processes – Outcomes of research concerning inter- and intra-professional cooperation] *Vierteljahresschrift Für Heilpädagogik Und Ihre Nachbargebiete, 83*, 283–294. https://doi.org/10.2378/vhn2014.art09d

Lysaker, J.T., Shaw, K., & Alicia, Z.A. (2016). Emergent reading comprehension: Social imagination and kindergarteners' readings of a wordless picture book. *Australian Journal of Language and Literacy, 39*(3), 245–256. https://gcaldwellspring2017.weebly.com/uploads/9/8/1/3/98138228/article_1_for_assignment_7.pdf

Machel, G. (2017). Good early development — the right of every child. *The Lancet, 389*(10064), 13-14. https://doi.org/ 10.1016/S0140-6736(16)31700-7

Magombo, F.B. (2015). *Teaching children with reading and writing difficulties in regular schools* (Master's thesis). Erasmus Mundus University of Roehampton, University of Oslo and Charles University. Retrieved from https://www.duo.uio.no//bitstream/handle/10852/53127/DISSERTATION-Magombo-Foster-UIO-FINAL.pdf?sequence=1

Mahomed-Asmail, F., Swanepoel, D.W., Eikelboom, R.H., Myburgh, H.C., & Hall, J. (2016). Clinical validity of hearScreen™ smartphone hearing screening for school children. *Ear and Hearing, 37*(1), 11-17. DOI:10.1097/AUD.0000000000000223

Manten, A., le Roux, M., Geertsema, S., & Graham, M. (2020). An investigation into the early literacy skills of English second language learners in South Africa. *Australasian Journal of Early Childhood, 45*(2), 142-154. DOI: 10.1177/1836939120918504

Marjanovič-Umek, L., Fekonja-peklaj, U., & Sočan, G. (2017). Early vocabulary, parental education, and the frequency of shared reading as predictors of toddler's vocabulary and grammar at age 2;7: A Slovenian longitudinal CDI study. *Journal of Child Language, 44*(2), 457-479. DOI:10.1017/S0305000916000167

Martan, V., Skočić Mihić, S., & Matošević, A. (2017). Teachers' attitudes toward teaching students with dyslexia. *Croatian Journal of Education, 19*(3), 75-97. https://doi.org/10.15516/cje.v19i0.2704

Martins, M.A., & Capellini, S.A. (2021). Identification of struggling readers or at risk of reading difficulties with one-minute fluency measures. *Psicol. Refl. Crít. 34***,** 1-10. https://doi.org/10.1186/s41155-021-00174-z

Mather, N., White, J., & Youman, M. (2018). Dyslexia around the world: A snapshot. *Learning Disabilities, 25*(1), 1-17. DOI:10.18666/LDMJ-2020-V25-I1-9552

McCloskey, M., & Rapp, B. (2017). Developmental dysgraphia: An overview and framework for research. *Cognitive neuropsychology*, *34*(3-4), 65–82. https://doi.org/10.1080/02643294.2017.1369016

McLean, E.J., Snow, P.C., Serry, T.A. (2021). Dual-qualified teachers and speech-language therapists reflect on preparation and practice in school-based language and literacy. *Child Language Teaching and Therapy, 1*, 1-15. DOI:10.1177/0265659021995543

Ministry of Education and Human Resources. (2006). *Towards a quality curriculum – Strategy for reform*. Retrieved from https://education.govmu.org/Documents/educationsector/Documents/primary-curr-framework.pdf

Ministry of Education and Human Resources. (2017). *Salient features of inclusive education for children and youth with special needs in Mauritius. Concept to reality. Policy framework and strategy document.* Retrieved from https://education.govmu.org/Documents/educationsector/Documents/Special Education Needs/Salient Features Strategy Doc (1).pdf

Mitchell, D. (2015). Inclusive education is a multi-faceted concept. *Center for Educational Policy Studies Journal*, *5*(1), 9-30. Retrieved from https://files.eric.ed.gov/fulltext/EJ1128952.pdf

Miundy, K., Zaman, H.B., Nordin, A., & Ng, K.H. (2019). Screening test on dyscalculia learners to develop a suitable augmented reality (AR) assistive learning application. *Malaysian Journal of Computer Science, Special Issue 2019*, 92-107. https://doi.org/10.22452/mjcs.sp2019no1.7

Mohammed, I., & Amponsah, O. (2018). Predominant factors contributing to low reading abilities of pupils at Elsie Lund Basic School in the Tamale Metropolis, Ghana. *African Educational Research Journal*, *6*(4), 273-278. DOI: 10.30918/AERJ.64.18.071

Montgomery, D. (2020). Identifying and remediating dyslexia in kindergarten and the foundation year, learning disabilities - neurological bases, clinical features and strategies of intervention, *Sandro Misciagna, IntechOpen*, *1*(1), 1-25. doi: 10.5772/intechopen.90808. https://www.intechopen.com/chapters/70837

Mosquera, Ó.A., Cárdenas, M.L., & Claudia Nieto, M. (2018). Pedagogical and research approaches in inclusive education in ELT in Colombia: Perspectives from some profile journal authors. *Profile Issues in Teachers Professional Development, 20*(2), 231-246. https://doi.org/10.15446/profile.v20n2.72992

Moxam, C. (2020). The link between language and spelling: what speech-language pathologists and teachers need to know. *Language, Speech, and Hearing Services in Schools*, *51*(4), 939-954. https://doi.org/10.1044/2020_LSHSS-19-00009

Nag, S., Vagh, S.B., Dulay, K.M., & Snowling, M.J. (2019). Home language, school language and children's literacy attainments: A systematic review of evidence from

low-and middle-income countries. *Review of Education, 7*(1), 91-150. https://doi.org/10.1002/rev3.3130

Nascimento, I.S.D., Rosal, A.G.C., & Queiroga, B.A.M.D. (2018). Elementary school teachers' knowledge on dyslexia. *Revista Cefac, 20*(1), 87-94. https://doi.org/10.1590/1982-021620182019117

Navas, A.L., Ciboto, T., & Borges J.P.A. (2017). Reading disorders and the role of speech-language pathologists. *Advances in Speech-Language Pathology,1*(2), 38-49. DOI: 10.5772/intechopen.70234.

Novita, S. (2016). Secondary symptoms of dyslexia: A comparison of self-esteem and anxiety profiles of children with and without dyslexia. *European Journal of Special Needs Education, 31*(2), 279-288. https://doi.org/10.1080/08856257.2015.1125694

Olkun, S., Altun, A., Sahin, S.G., & Denizli, Z.A. (2015). Deficits in basic number competencies may cause low numeracy in primary school children. *Education and Science, 40*(177), 141-159. https://doi.org/10.15390/EB.2015.3287

Ostertag, C., Reynolds, J.E., Dewey, D., Landman, B., Huo, Y., & Lebel, C. (2021). Altered gray matter development in pre-reading children with a family history of reading disorder. *Developmental Science*, e13160. https://doi.org/10.1111/desc.13160

Owodally, A.M.A. (2013). Exposing pre-schoolers to the printed word: A case study of preschool teachers in Mauritius. *Journal of Early Childhood Literacy, 13*(1), 52-97. https://doi.org/10.1177/1468798411429933

Ozernov-Palchik, O., & Gaab, N. (2016). Tackling the 'dyslexia paradox': Reading brain and behavior for early markers of developmental dyslexia. *Wiley Interdisciplinary Reviews: Cognitive Science, 7*(2), 156-176. DOI: 10.1002/wcs.1383

Ozturk, G., Hill, S., & Yates, G. (2016). Girls, boys and early reading: Parents' gendered views about literacy and children's attitudes towards reading. *Early Child Development and Care, 186*(5), 703–715. DOI: 10.1080/03004430.2015.1053477

Patscheke, H., Degé, F., & Schwarzer, G. (2018). The effects of training in rhythm and pitch on phonological awareness in four- to six-year-old children. *Psychology of Music, 47* (3) 1–16. https://doi.org/10.1177/0305735618756763

Paterlini, L.S.M., Zuanetti, P.A., Pontes-Fernandes, A.C., Fukuda, M.T.H., & Hamad, A.P.A. (2019). Screening and diagnosis of learning disabilities/disorders-outcomes of interdisciplinary assessments. *Revista CEFAC, 21*(5), 1-8. DOI: 10.1590/1982-0216/201921513319

Paz-Alonso, P.M., Oliver, M., Lerma-Usabiaga, G., Caballero-Gaudes, C., Quiñones, I., Suárez-Coalla, P., Duñabeitia, J.A., Cuetos, F., & Carreiras, M. (2018). Neural correlates of phonological, orthographic and semantic reading processing in dyslexia. *NeuroImage Clinical, 20*, 433–447. https://doi.org/10.1016/j.nicl.2018.08.018

Peterson, R.L., & Pennington, B.F. (2015). Developmental dyslexia. *The Lancet, 11*, 283-307. DOI: 10.1146/annurev-clinpsy-032814-112842.

Pit-ten Cate, I.M., Markova, M., Krischler, M., & Krolak-Schwerdt, S. (2018). Promoting inclusive education: The role of teachers' competence and attitudes. *Insights into Learning Disabilities*, *15*(1), 49-63. Retrieved from https://files.eric.ed.gov/fulltext/EJ1182863.pdf

Ponto, J. (2015). Understanding and evaluating survey research. *Journal of the Advanced Practitioner in Oncology*, *6*(2), 168- 171. https://www.researchgate.net/publication/286445115_Understanding_and_Evaluating_Survey_Research

Prestes, M.R.D., & Feitosa, M.A.G. (2017). Theories of dyslexia: Support by changes in auditory perception. *Psicologia: Teoria e Pesquisa*, *32*, 1-9. DOI: http://dx.doi.org/10.1590/0102-3772e32ne24

Price, K.M., Wigg, K.G., Misener, V.L., Clarke, A., Yeung, N., Blokland, K., Margaret Wilkinson, M., Kerr , E.N., Guger, S.L., Lovett, M.W., & Barr, C.L. (2018). Language difficulties in school-aged children with developmental dyslexia. *Journal of Learning Disabilities*, *19*(1), 32-40. 00222194211006207. https://doi.org/10.1177/00222194211006207

Puranik, C.S., Phillips, B.M., Lonigan, C.J., & Gibson, E. (2018). Home literacy practices and preschool children's emergent writing skills: An initial investigation. *Early Childhood Research Quarterly*, *42*(1), 228–238. https://doi. org/10.1016/j.ecresq.2017.10.004

Rapin, I. (2016). Dyscalculia and the calculating brain. *Pediatric Neurology*, *61*, 11-20. http://dx.doi.org/ 10.1016/j.pediatrneurol.2016.02.007

Raschle, N.M., Becker, B.L.C., Smith S, Fehlbaum, L.V., Wang, Y., & Gaab, N. (2017). Investigating the influences of language delay and/or familial risk for dyslexia on brain structure in 5-year-olds. *Cereb Cortex*, *27*(1):764–76. https://doi.org/10.1093/cercor/bhv267

Rauf, A.A., Akmar Ismail, M., Balakrishnan, V., Cheong, L.S., Admodisastro, N.I., & Haruna, K. (2021). Analysis of support for parents in raising children with dyslexia. *Journal of Family Issues*, *42*(2), 276-292. DOI: 10.1177/0192513X20948925

Richter, L.M., Daelmans, B., Lombardi, J., Heymann, J., Boo, F.L., Behrman, J.R., Lu, C., Lucas, J.E., Perez-Escamilla, R., Dua, T., Bhutta, Z.A., Stenberg, K., Gertler, P., Darmstadt, G.L., & Paper 3 Working Group and the Lancet Early Childhood Development Series Steering Committee (2017). Investing in the foundation of sustainable development: Pathways to scale up for early childhood development. *Lancet*, *389*(10064), 103–118. https://doi.org/10.1016/S0140-6736(16)31698-1

Ross, H. (2020). “It’s a battle!”: Parenting and supporting a child with dyslexia. *Dyslexia,* IntechOpen, DOI: 10.5772/intechopen.93948. Available from: https://www.intechopen.com/chapters/73999

Ross, T. (2016). The differential effects of parental involvement on high school completion and postsecondary attendance. *Education Policy Analysis Archives, 24*(30/31), 1-38. DOI:10.14507/epaa.v24.2030

Sahu, A., Bhargava, R., Sagar, R., & Mehta, M. (2018). Perception of families of children with specific learning disorder: An exploratory study. *Indian Journal of Psychological Medicine, 40*(5), 406-413. DOI:10.4103/IJPSYM.IJPSYM_148_18

Saloviita, T. (2020). Teachers’ changing attitudes and preferences around inclusive education. *International Journal of Disability, Development and Education*, 1-18. https://doi.org/10.1080/1034912X.2020.1828569

Saravanabhavan, S., & Saravanabhavan, R.C. (2010). Knowledge of learning disability among pre-and in-service teachers in India. *International Journal of Special Education*, *25*(3), 132-138. Retrieved from https://files.eric.ed.gov/fulltext/EJ909291.pdf

Schiff, R., & Joshi, R.M. (Eds.). (2016). *Interventions in learning disabilities: A handbook on systematic training programs for individuals with learning disabilities*. Springer. DOI:10.1007/978-3-319-31235-4

Schonell, F.J. (1952). *Schonell Spelling Tests*. Nelson Thornes Ltd.

Schwabe, F., McElvany, N., & Trendtel, M. (2015). The school age gender gap in reading achievement: Examining the influences of item format and intrinsic reading motivation. *Reading Research Quarterly*, *50*(2), 219-232. doi:10.1002/rrq.92

Shah, H.R., Sagar, J., Somaiya, M.P., & Nagpal, J.K. (2019). Clinical practice guidelines on assessment and management of specific learning disorders. *Indian Journal of Psychiatry*, *61*(2), 211–225. https://doi.org/10.4103/psychiatry.IndianJPsychiatry_564_18

Shifrer, D., Muller, C., & Callahan, R. (2010). *Disproportionality: A sociological perspective of the identification by schools of students with learning disabilities*. Emerald Group Publishing Limited, *5*, 279-308. DOI:10.1108/S1479-3547(2010)0000005014

Shukla, P., & Agrawal, G. (2015). Awareness of learning disabilities among teachers of primary schools. *Online Journal of Multidisciplinary Research, 1*(1), 33-38. Retrieved from: www.ojmr.in

Snowling, M.J., & Melby-Lervåg, M. (2016). Oral language deficits in familial dyslexia: A meta-analysis and review. *Psychological Bulletin, 142* (5), 498–545. DOI:10.1037/bul0000037

Snowling, M.J., Nash, H.M., Gooch, D.C., Hayiou-Thomas, M.E., Hulme, C., & Welcome Language and Reading Project Team. (2019). Developmental outcomes for children at

high risk of dyslexia and children with developmental language disorder. *Child Development, 90*(5), 548-564. https://doi.org/10.1111/cdev.13216

Sonck, G. (2005). Language of instruction and instructed languages in Mauritius. *Journal of Multilingual and Multicultural Development, 26*(1), 37-51. https://doi.org/10.1080/14790710508668397

Special Education Needs Authority Act (*2018*). (Ministry of Education and Human Resources, Mauritius). Retrieved from https://education.govmu.org/Documents/educationsector/Documents/Special%20Education%20Needs/Special%20Education%20Needs%20Education%20Needs%20Authority%20Act.pdf

Speltz, M.L., Wallace, E.R., Collett, B.R., Heike, C.L., Luquetti, D.V., & Werler, M.M. (2017). Intelligence and academic achievement of adolescents with craniofacial microsomia. *Plastic and Reconstructive Surgery*, *140*(3), 571–580. https://doi.org/10.1097/PRS.0000000000003584

Spencer, M., & Wagner, R.K. (2018). The comprehension problems of children with poor reading comprehension despite adequate decoding: A meta-analysis. *Review of Educational Research, 88*(3), 366-400. DOI: 10.3102/0034654317749187

Squarza, C., Picciolini, O., Gardon, L., Gianní, M. L., Murru, A., Gangi, S. (2016). Learning disabilities in extremely low birth weight children and neurodevelopmental profiles at preschool age. Front. Psychol. 7:998. DOI: 10. 3389/fpsyg.2016.00998

Sylvan, L. (2018). Tiers to communication success: How can SLPs join in the MTSS framework many schools are adopting to catch students' special education needs earlier and provide levels of intervention?. *The ASHA Leader*, *23*(8), 44-53. https://doi.org/10.1044/leader.FTR1.23082018.44

Thompson, C., Bacon, A.M., & Auburn, T. (2015). Disabled or differently enabled? Dyslexic identities in online forum postings. *Disability and Society*, *30* (9), 1328–1344. DOI:10.1080/09687599.2015.1093460

Tran, T.Q., & Duong, T.M. (2020). Insights into listening comprehension problems: A case study in Vietnam. *PASAA: Journal of Language Teaching and Learning in Thailand, 59*, 77-100. https://files.eric.ed.gov/ fulltext/EJ1239999.pdf

UNESCO 1994, *The Salamanca Statement and Framework for Action on Special Needs Education.* Adopted by the World Conference on Special Needs Education; Access and Quality. Salamanca, Spain, 7-10 June 1994. Unesco.

UNESCO, 2005, *Guidelines for inclusion: Ensuring access to education for all.* UNESCO. Retrieved from: http://www.ibe.unesco.org/sites/default/files/Guidelines_for_Inclusion_UNESCO_2006.pdf

UNESCO. (2017). Global education monitoring report 2017/18: Accountability in education. https://en.unesco.org/gem-report/report/ 2017/accountability-education

Usman, B., Aziz, Z.A., & Absida, N.R. (2017). Improving reading comprehension using metacognitive strategies. *English Education Journal, 8*(4), 425-438. www.jurnal.unsyiah.ac.id/EEJ/article/view/9194/7203

Van Bergen, E., Van Zuijen, T., Bishop, D., & De Jong, P.F. (2017). Why are home literacy environment and children's reading skills associated? What parental skills reveal. *Reading Research Quarterly*, *52*(2), 147-160. https://doi.org/10.1002/rrq.160

Van Viersen, S., De Bree, E.H., Zee, M., Maassen, B., Van Der Leij, A., & De Jong, P.F. (2018). Pathways into literacy: The role of early oral language abilities and family risk for dyslexia. *Psychological Science*, *29*(3), 418–428. https://doi.org/10.1177/0956797617736886

Vasudevan, A. (2017). Slow learners. Causes, problems and educational programmes. *International Journal of Applied Research*, *3*(12), 308-313. Retrieved from https://www.allresearchjournal.com/archives/?year=2017&vol=3&issue=12&part=E&ArticleId=4656

Vaughn, M., & Parsons, S.A. (2013). Adaptive teachers as innovators: Instructional adaptations opening spaces for enhanced literacy learning. *Language Arts, 91*(2), 81-93. Retrieved from http://www.jstor.org/stable/24575032

Veerabudren, S., Kritzinger, A., Ramasawmy, S.T., Geertsema, S., & Le Roux, M. (2021). Teachers' perspectives on learners with reading and writing difficulties in mainstream government primary schools in Mauritius. *South African Journal of Childhood Education, 11*(1), a1023. https://doi.org/10.4102/sajce.v11i1.1023

Veerabudren, S., Kritzinger A., & Graham, M., Geertsema, S., & Le Roux, M. (n.d.) Parental perspectives on their Grade 4 children with reading and writing difficulties in mainstream government schools in Mauritius. *Indonesian Journal of Education*, In press.

Vernon-Feagans, L., Kainz, K., Hedrick, A., Ginsberg, M. & Amendum, S. (2013). Live webcam coaching to help early elementary classroom teachers provide effective literacy instruction for struggling readers: The Targeted Reading Intervention. *Journal of Educational Psychology*, 105(4), pp. 1175–1187. http://doiorg/10.1037/a0032143

Vidyadharan, V., Tharayil, H.M., & George, B. (2017). Validation of a screening tool for learning disorder in children. *Indian Journal of Psychological Medicine, 39*(6), 737-740. DOI:10.4103/IJPSYM.IJPSYM_29_17

Villiger, C. (2020). Benefits and constraints of parent involvement in children's reading promotion: General research trends and evidence from a Swiss paired reading intervention study. In *Parenting-studies by an ecocultural and transactional perspective*. IntechOpen. DOI: 10.5772/intechopen.93136

Virinkoski, R., Lerkkanen, M.K., Eklund, K., & Aro, M. (2020). Special education teachers' identification of students' reading difficulties in Grade 6. *Scandinavian Journal of Educational Research, 1*(1), 1-14. https://doi.org/10.1080/00313831.2020.1833241

Wagner, R.K., Zirps, F.A., Edwards, A.A., Wood, S.G., Joyner, R.E., Becker, B.J., ... & Beal, B. (2020). The prevalence of dyslexia: A new approach to its estimation. *Journal of Learning Disabilities, 53*(5), 354-365. https://doi.org/10.1177/0022219420920377

Washburn, E.K., Mulcahy, C.A., Musante, G., & Joshi, R. (2017). Novice teachers' knowledge of reading-related disabilities and dyslexia. *Learning Disabilities: A Contemporary Journal, 15*(2), pp.169-191. Retrieved from EJ1160653.pdf (ed.gov)

Wiederholt, J.L., & Bryant, B. (2001). *Gray Oral Reading Test,* 4th edition (GORT-4). Pro-Ed.

Wiig, E.H., Semel, E., & Secord, W.A. (2013). *Clinical Evaluation of Language Fundamentals,* 5th edition (CELF-5). NCS Pearson.

Wium, A.M., & Louw, B. (2013). Revisiting the roles and responsibilities of speech-language therapists in South African schools. *South African Journal of Communication Disorders, 60*(1), 31-37. doi: https://doi.org/10.4102/sajcd.v60i1.8

Xia, Z., Hancock, R., & Hoeft F. (2017). Neurobiological bases of reading disorder. Part I: Etiological investigations. *Lang Linguist Compass, 11*(4), 122-39. https://doi.org/10.1111/lnc3.12239.

Xu, A., Baysari, M.T., Stocker, S.L., Leow, L.J., Day, R.O., & Carland, J.E. (2020). Researchers' views on, and experiences with, the requirement to obtain informed consent in research involving human participants: A qualitative study. *BMC Med Ethics, 21*(1), 1-11. https://doi.org/10.1186/s12910-020-00538-7

Yada, A., & Savolainen, H. (2017). Japanese in-service teachers' attitudes toward inclusive education and self-efficacy for inclusive practices. *Teaching and Teacher Education, 64,* 222-229. https://doi.org/10.1016/j.tate.2017.02.005

Yan, X., Jiang, K., Li, H., Wang, Z., Perkins, K., & Cao, F. (2021). Convergent and divergent brain structural and functional abnormalities associated with developmental dyslexia. *eLife, 10,* e69523. https://doi.org/10.7554/eLife.69523

Yoong, S.M., & Ahmad, N.A. (2020). A view on theories and models in the study of dyscalculia. *International Journal of Academic Research in Business and Social Sciences, 9*(3), 128-137. http://dx.doi.org/10.6007/IJARPED/v9-i3/8257

Yoong, S.M., & Ahmad, N.A. (2021). Characteristics of dyscalculia in mathematics learning. *Jurnal Pendidikan Bitara UPSI, 14*(1), 15-22. DOI:10.37134/bitara.vol14.1.2.2021

Zarkowska, E., & Clements, J. (1988). Problem behaviour and people with severe learning disabilities: The S.T.A.R Approach. Routledge. https://doi.org/10.4324/9780429468209

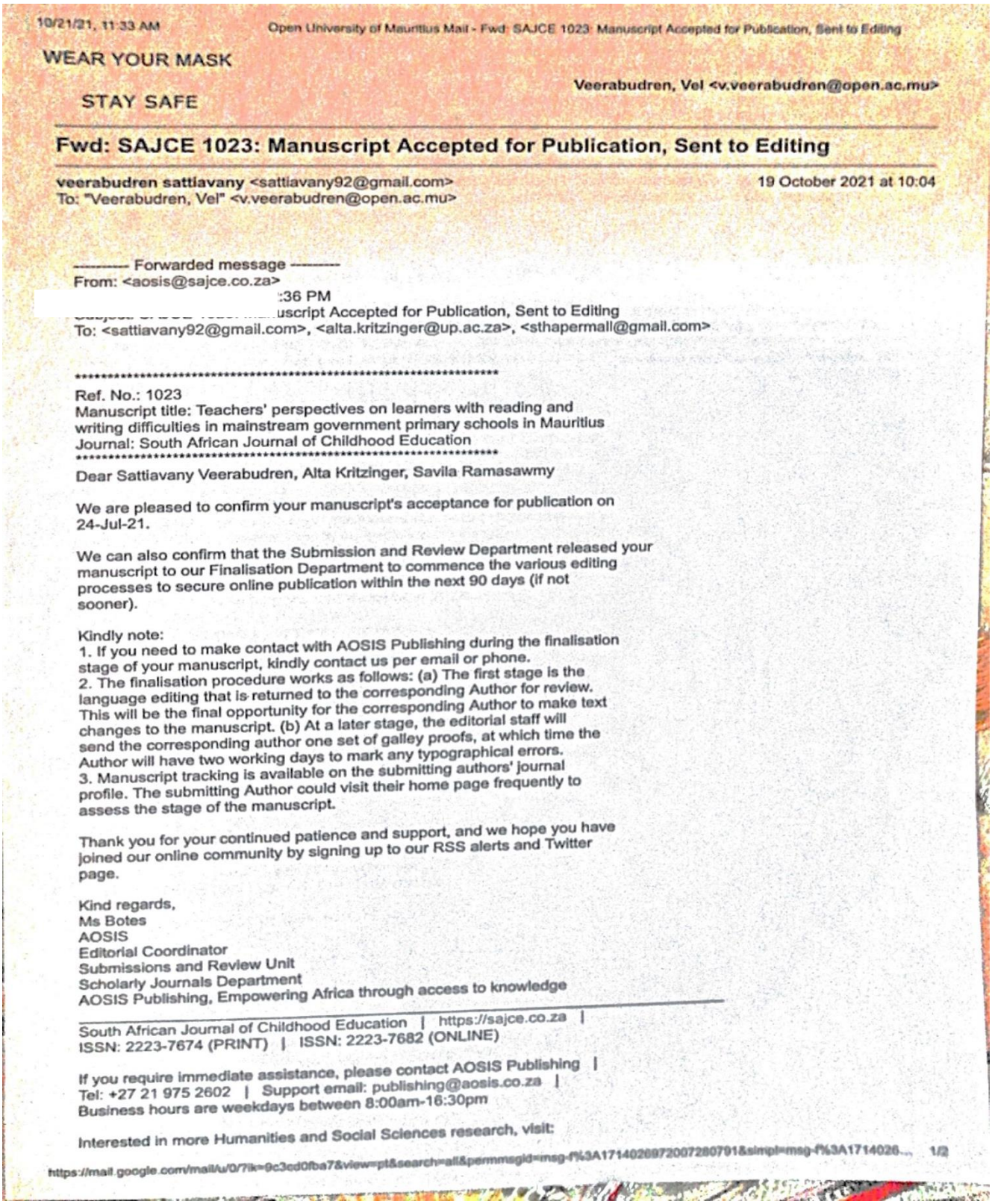
Žarić, G., Timmers, I., Gerretsen, P., Fraga González, G., Tijms, J., van der Molen, M.W., & Bonte, M. (2018). Atypical white matter connectivity in dyslexic readers of a fairly transparent orthography. *Frontiers in Psychology, 9,* 1147-1162. DOI: 10.3389/fpsyg.2018.01147

Zivoder, I., Martic-Biocina, S., Miklecic, J., & Kozina, G. (2017). Attitudes and knowledge of parents of preschool children about specific learning disabilities. *Psychiatria Danubina*, *29*(3), 571-574. https://www.researchgate.net/publication/322655767

Zwane, S.L., & Malale, M.M. (2018). Investigating barriers teachers face in the implementation of inclusive education in high schools in Gege Branch, Swaziland. *Afr J Disabil. 6*(7), 391-403. DOI: 10.4102/ajod.v7i0.391.

APPENDICES

Appendix A: Article 1 proof of acceptance for publication



10/21/21, 11:33 AM Open University of Mauritius Mail - Fwd: SAJCE 1023: Manuscript Accepted for Publication, Sent to Editing

WEAR YOUR MASK

STAY SAFE

Veerabudren, Vel <v.veerabudren@open.ac.mu>

Fwd: SAJCE 1023: Manuscript Accepted for Publication, Sent to Editing

veerabudren sattiavany <sattiavany92@gmail.com> 19 October 2021 at 10:04
To: "Veerabudren, Vel" <v.veerabudren@open.ac.mu>

---------- Forwarded message ---------
From: <aosis@sajce.co.za>
:36 PM
uscript Accepted for Publication, Sent to Editing
To: <sattiavany92@gmail.com>, <alta.kritzinger@up.ac.za>, <sthapermall@gmail.com>

****
Ref. No.: 1023
Manuscript title: Teachers' perspectives on learners with reading and writing difficulties in mainstream government primary schools in Mauritius
Journal: South African Journal of Childhood Education
****

Dear Sattiavany Veerabudren, Alta Kritzinger, Savila Ramasawmy

We are pleased to confirm your manuscript's acceptance for publication on 24-Jul-21.

We can also confirm that the Submission and Review Department released your manuscript to our Finalisation Department to commence the various editing processes to secure online publication within the next 90 days (if not sooner).

Kindly note:
1. If you need to make contact with AOSIS Publishing during the finalisation stage of your manuscript, kindly contact us per email or phone.
2. The finalisation procedure works as follows: (a) The first stage is the language editing that is returned to the corresponding Author for review. This will be the final opportunity for the corresponding Author to make text changes to the manuscript. (b) At a later stage, the editorial staff will send the corresponding author one set of galley proofs, at which time the Author will have two working days to mark any typographical errors.
3. Manuscript tracking is available on the submitting authors' journal profile. The submitting Author could visit their home page frequently to assess the stage of the manuscript.

Thank you for your continued patience and support, and we hope you have joined our online community by signing up to our RSS alerts and Twitter page.

Kind regards,
Ms Botes
AOSIS
Editorial Coordinator
Submissions and Review Unit
Scholarly Journals Department
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Appendix B: Article 2 proof of acceptance for publication

WEAR YOUR MASK

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Veerabudren, Vel <v.veerabudren@open.ac.mu>

Fwd: [IJE] Editor Decision

veerabudren sattiavany <sattiavany92@gmail.com> 19 October 2021 at 10:02
To: "Veerabudren, Vel" <v.veerabudren@open.ac.mu>

---------- Forwarded message ---------
From: **Lukman Hakim** <lukman_hakim@upi.edu>
Date: Thu, Sep 9, 2021 at 11:54 AM
Subject: [IJE] Editor Decision
To: Ms sattiavany veerabudren <sattiavany92@gmail.com>
Cc: Alta Kritzinger <alta.kritzinger@up.ac.za>, Marien Alet Graham <marien.graham@up.ac.za>, Salomé Geertsema <salome.geertsema@up.ac.za>, Mia Leroux <mia.leroux@up.ac.za>

Dear Ms sattiavany veerabudren:

Thank you for your submission to the International Journal of Education, "Parental perspectives on their Grade 4 children with reading and writing difficulties in mainstream government schools in Mauritius".

After carefully reviewing your manuscript, our decision is to accept your submission after you have revised the manuscript based on the reviewer's comments and suggestions. Please do the following things:
1. confirm that you have received this notification by replying to this email;
2. highlight the revision you have made in the manuscript;
3. send it back to us no later than 16 September 2021.

We are looking forward to receiving your revision.

Lukman Hakim
Universitas Pendidikan Indonesia
lukman_hakim@upi.edu

International Journal of Education
ije.journal@upi.edu
http://ejournal.upi.edu/index.php/ije

--
Kind regards...
Miss. Sattiavany Veerabudren
Audiologist and Speech Language Therapist
Address: 2, benny narain lalah st,Mont Roches
Contact;: +230 4645672 (office)/ 58131162 (mobile)

Email: sattiavany92@gmail.com (personal)

---

2 attachments

IJE_REVIEW FORM-#35463.docx
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Manuscript-#35463.doc
187K

Appendix C: Proof of submission Article 3

WEAR YOUR MASK

STAY SAFE

Veerabudren, Vel <v.veerabudren@open.ac.mu>

Fwd: SAJCD Submission 863 – Acknowledgement of manuscript receipt to all the co-authors

veerabudren sattiavany <sattiavany92@gmail.com> 19 October 2021 at 10:01
To: "Veerabudren, Vel" <v.veerabudren@open.ac.mu>

---------- Forwarded message ---------
From: <aosis@sajcd.org.za>
Date: Mon, Oct 18, 2021 at 8:46 AM
Subject: SAJCD Submission 863 – Acknowledgement of manuscript receipt to all the co-authors
To: Sattiavany Veerabudren <sattiavany92@gmail.com>, Alta Kritzinger <alta.kritzinger@up.ac.za>, Marien A. Graham <marien.graham@up.ac.za>, Salome - Geertsema <salome.geertsema@up.ac.za>, Mia le Roux <mia.leroux@up.ac.za>

****
Ref. No.: 863
Manuscript title: Grade 4 learners with reading and writing difficulties in mainstream government schools in Mauritius
Journal: South African Journal of Communication Disorders
****

Dear Sattiavany Veerabudren, Alta Kritzinger, Marien Graham, Salome Geertsema, Mia le Roux

The above manuscript, for which you are listed as a contributing author, has been received by the journal. Future communications regarding this manuscript will be sent to the corresponding author only, Ms Veerabudren.

If you need to contact us or the publisher about your manuscript for any reason, please be sure to quote the journal name and manuscript reference number 863.

Kind regards,
Ms Stain
AOSIS Pty Ltd

****
Frequently Asked Question
What does it mean to be a co-author?
****

If your manuscript is a multi-authored manuscript, and you are listed as a contributing author all co-authors (collaborators) share a degree of responsibility for manuscripts they collaborate on, and it is essential that you are informed and aware that you are listed as a contributor. The publisher is a member of the Committee of Publication Ethics.
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Appendix D: Permission letter and approval letter from Ministry of Education, Tertiary Education, Science and Technology

UNIVERSITEIT VAN PRETORIA

UNIVERSITY OF PRETO RIA

YUNIBESITHI YA PRETORIA

Faculty of Humanities

Department of Speech-Language Pathology and Audiology

August 2020

Attention: Senior Chief Executive

Mr R Meettook

Ministry of Education, Tertiary Education, Science, and Technology

3rd floor, MITD House Pont Fer, Phoenix

Republic of Mauritius

Respected Sir

Subject: Permission for conducting a research in government primary schools

I am a PhD student at the Department of Speech-Language Pathology and Audiology at the University of Pretoria, South Africa. The title of my research study is "Grade 4 learners with reading and writing **difficulties in Mauritius: characteristics and perspectives"** and I am requesting permission to conduct a research study in government primary schools in Mauritius. I would like to recruit Grade 4 teachers, Grade 4 learners without any reading and writing difficulties, Grade 4 learners with reading and writing difficulties, and their parents to participate in three studies related to the research study mentioned above. I also request permission to use an unused room to assess the learners and for teachers to complete questionnaires. The research will not interfere with teaching activities.

Information about the Research Study

The aim of the study is to investigate reading and writing difficulties of Grade 4 learners in Mauritius, who may possibly present with Specific Learning Disorder. The research comprises of the following three studies:

Study 1: "Teachers' perspectives to support Grade 4 learners with reading and writing difficulties in Mauritius"

Study 2: "Parental perspectives about their children's reading and writing difficulties in Mauritius"

Study 3: "Characteristics of Grade 4 learners with reading and writing difficulties from mainstream schools in Mauritius"

This research will recruit valuable information about the status of reading writing difficulties among Grade 4 learners in primary government schools in Mauritius. The tests administered to assess reading and writing characteristics in these learners will contribute to the necessity for more specific secondary language assessment by speech-language therapists in the country and work towards planning appropriate intervention options. The researcher will obtain ethical clearance from the Research and Ethics Committee of the Faculty of Humanities, University of Pretoria, South Africa, before data collection will commence. Written informed consent will be obtained from all participating teachers and parents, and learners will give assent before data collection commence.

The participants for this research will be recruited from government primary schools in Mauritius belonging to Zone 2 due to similar demographical aspects, i.e. the proximity of the schools and uniformity in socio-economic status of the families and teachers.A list of government primary schools will be obtained from the Department of Primary Education in Mauritius. This list will be separated into two, based on the school's location, which is urban or rural. Each school from the two lists will be allotted a number. Using the lottery method, the equivalent proportion of schools according to the urban and rural ratio will be selected and asked to participate. In case a school from either list objects to participate, another school will be selected from the same list using the lottery methqd. Approximately 24 schools are required to meet the sample size of all three studies.

Participant Candidacy:

Study 1: Grade 4 teachers working in government schools in Mauritius with at least three years of working experience.

Study 2: Parents of Grade 4 learners with reading and writing difficulties.

Study 3: The study group and the control group will be Grade 4 learners with reading and writing difficulties, based on a screening tool for learning disorder by Vidyadharan et al., 2017. The control group will have to score <10 and the study group will have to score ≥ 10 on the screening tool for learning disorder for inclusion in the research study.

Study procedures and duration

Study 1: Participating teachers will complete a questionnaire consisting of questions regarding reading and writing difficulties and Specific Learning Disorder. Teachers will have to complete the questionnaire on the school premises which will take approximately 20 minutes.

Study 2: Participating parents will complete a questionnaire regarding their child's early history and their experiences of the child's difficulties. It will take approximately 20 minutes to complete the parent questionnaire. The data collection will take place on a specific date and time at the parent's convenience.

Study 3: Grade 4 learners will be assessed individually by me, a qualified and registered speech-language therapist (researcher), using validated tests. The learners will be asked to carry out a few tasks stipulated in the tests, allowing me to describe the characteristics of their reading and writing difficulties. The learners will be assessed on the school premises and the process may require a maximum of 40 minutes.

Possible Risks and Benefits Associated with this Study

The three studies do not involve potential risks or administration of harmful substances. All participants will be treated with respect and sensitivity.

Confidentiality and Anonymity

The researcher will ensure that all the data collected will be treated as confidential and accessed only by the researcher and the supervisors. The names of the schools and participants will not be used in the thesis and articles that will be ensured from the research.

Refusal or Withdrawal from the Research

Participants may withdraw from the research study at any point of time, should they wish to do so.

No actions will be taken against them as participation in this study is completely voluntary.

Contact Information

If you would like further information on the research study, please contact me or my supervisors at:

Researcher: Ms Sattiavany Veerabudren (Speech-Language Therapist)

Contact No.: (+230) 58131162 / 4645674

Email ID : sattiavanv92@gmaiI.com

Alternatively, you may contact my supervisors at:

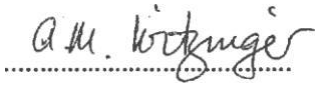
Prof Alta Kritzinger: alta.kritzinger@up.ac.za

Dr Salomé Geertsema: salome.geertsema@up.ac.za

Dr Mia ie Roux: mia.Ieroux@up.ac.za

Thank you very much for your consideration.

Yours sincerely



……

Sattiavany Veerabudren **Prof A Kritzinger**

Researcher **Main Supervisor**

Dr. Salome Geertsema **Dr Mia Le Roux**

Co supervisor **Co supervisor**

Prof Van Der Linde

Head: Department of Speech-Language Pathology and Audiology

WEAR YOUR MASK

STAY SAFE

Veerabudren, Vel <v.veerabudren@open.ac.mu>

Fwd: Permission for research

veerabudren sattiavany <sattiavany92@gmail.com> 19 October 2021 at 10:02
To: "Veerabudren, Vel" <v.veerabudren@open.ac.mu>

---------- Forwarded message ---------
From: **Rajiv Kumar Aukhojee** <rkaukhojee@govmu.org>
Date: Tue, Jan 12, 2021 at 12:29 PM
Subject: Permission for research
To: veerabudren sattiavany <sattiavany92@gmail.com>
Cc: Umah Devi Jeetun <ujeetun@govmu.org>, Rajiv Kumar Aukhojee <rkaukhojee@govmu.org>

Dear Miss Sattiavany Veerabudren

This is to inform you that this Ministry has accepted your request for data collection as part of research study, for PhD Programme at University of Pretoria, South Africa, with research title " Grade 4 learners with reading and writing difficulties in Mauritius : characteristics and perspectives"; subject to the following conditions:

1. You will have to liaise with the Principal School Inspector (PSI) at Zone 2 to establish a time frame for data collection and also inform the Zone of the schools selected.

2. Participation to the research to be on strictly voluntary basis.

3. You are requested to meet Head of Schools prior to data collection and establish a time frame for data collection.

4. School will not provide information on parents to you.

5. This Ministry reserves the right to withdraw permission for research if it is felt the welfare of pupils and staff are jeopardized.

6. You are requested to submit a copy of research to this Ministry after completion of course.

7. Schools should not be disturbed during the data collection procedures.

MINISTRY OF EDUCATION, TERTIARY EDUCATION, SCIENCE AND TECHNOLOGY
ZONE 2

My Ref.: Z@/PF/W332 V2

Your Ref: Date: 10 July 2020

From: Director, Zone 2, Minisfry of Education, Teråary Education, Science and Technology, Herchenroder Street, Beau Bassin.

To: Miss Veerabudren Sattiavany, Audiologist and Speech Therapist.

Approval is being conveyed to you to carry your research work for your PhD Programme as student at University of Pretoria, South Africa at the schools as per the attached list.

You are requested to submit a copy of this approval letter to the Heads of the schools.

Best regards.

T. Mutty
Director

Mutty

Appendix E: Letter to request permission from the participating schools

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
Denkleiers • Leading Minds • Dikgopolo tša Dihlalefi

Faculty of Humanities

Department of Speech-Language Pathology

and Audiology

Date

Dear Principal

Subject: Permission for conducting research in government primary schools

I am a PhD student at the Department of Speech-Language Pathology and Audiology at the University of Pretoria, South Africa. The title of my research study is **"Grade 4 learners with reading and writing difficulties in Mauritius: characteristics and perspectives"** and I am requesting permission to conduct a research study in government primary schools in Mauritius.

I would like to recruit Grade 4 teachers, Grade 4 learners without reading and writing difficulties, Grade 4 learners with any reading and writing difficulties and their parents to participate in three studies related to the research study mentioned above. I also request permission to use an unused room to assess the learners and for the teachers to complete questionnaires. The research will not interfere with teaching activities.

Information about the Research Study

The aim of the study is to investigate reading and writing difficulties of Grade 4 learners in Mauritius who may possibly present with Specific Learning Disorder. The research comprises of the following three studies:

Study 1: "Teachers' perspectives and readiness to support Grade 4 learners with reading and writing difficulties in Mauritius"

Study 2:"Parental perspectives about their children's reading and writing difficulties in Mauritius"

Study 3: "Characteristics of Grade 4 learners with reading and writing difficulties from mainstream schools in Mauritius". This research will recruit valuable information about the status of reading writing difficulties among Grade 4 learners in primary government schools in Mauritius. The tests administered to assess reading and writing characteristics in these learners will contribute to the necessity for more specific secondary language assessment by speech-language therapists in the country and work towards planning appropriate intervention options.

The researcher will obtain ethical clearance from the Research and Ethics Committee of the Faculty of Humanities, University of Pretoria, South Africa, before data collection will commence. Written informed consent will be obtained from all participating teachers and parents, and learners will give assent before data collection commence.

The participants for this research will be recruited from government primary schools in Mauritius belonging to Zone 2 due to similar demographical aspects, i.e. the proximity of the schools and uniformity in socio-economic status of the families and teachers. A list of government primary schools will be obtained from the Department of Primary Education in Mauritius. This list will be separated into two, based on the school's location, which is urban or rural. Each school from the two lists will be allotted a number. Using the lottery method, the equivalent proportion of schools according to the urban and rural ratio will be selected and asked to participate. In case a school from either list objects to participate, another school will be selected from the same list using the lottery method. Approximately 20 schools are required to meet the sample size of all three studies.

Participant Candidacy:

Study 1: Grade 4 teachers working in government schools in Mauritius with at least three years of working experience.

Study 2: Parents of Grade 4 learners with reading and writing difficulties.

Study 3: The study group will be Grade 4 learners with reading and writing difficulties, based on the screening tool for learning disorder which will be used to identified learners with reading and writing difficulties (Vidyadharan et al., 2017). The control group will be Grade 4 learners without any reading and writing difficulties.

Study procedures and duration

Study 1: Participating teachers will complete a questionnaire consisting of questions regarding reading and writing difficulties and Specific Learning Disorder. Teachers will have to complete the questionnaire on the school premises during the Asian Language period which will take approximately 20 minutes.

Study 2: Participating parents will complete a questionnaire regarding their child's early history and their experiences of the child's difficulties. It will take approximately 20 minutes to complete the parent questionnaire. The questionnaire can be filled via telephone or at the researcher's office.

Study 3: Grade 4 learners will be assessed individually by myself, a qualified and registered speech-language therapist (researcher), using validated tests. The learners will be asked to carry out a few tasks stipulated in the tests, allowing me to describe the characteristics of their reading and writing difficulties. The learners will be assessed on the school premises and the process may require a maximum of 40 minutes.

Possible Risks and Benefits Associated with this Study

The three studies do not involve potential risks or administration of harmful substances. All participants will be treated with respect and sensitivity. Parents will receive their children's test results and subsequent recommendations for intervention will be made by means of a referral letter.

Confidentiality and Anonymity

The researcher will ensure that all the data collected will be treated as confidential and accessed only by the researcher and the supervisors. The names of the schools and participants will not be used in the thesis and articles that will be ensured from the research.

Refusal or Withdrawal from the Research

Participants may withdraw from the research study at any point of time, should they wish to do so.

No actions will be taken against them as participation in this study is completely voluntary.

Contact Information

If you would like further information on the research study, please contact me or my supervisors at:

Researcher: Ms Sattiavany Veerabudren (Speech-Language Therapist)

Contact No.: (+230) 58131162 / 4645674

Email ID : sattiavany92@gmail.com

Alternatively, you may contact my supervisors at:

Prof. Alta Kritzinger: alta.kritzinger@up.ac.za

Dr Salome Geertsema: salome.geertsema@up.ac.za

Dr Mia le Roux: mia.leroux@up.ac.za

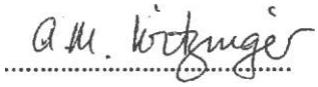
Thank you very much for your consideration.

Yours sincerely

.....

Sattiavany Veerabudren

Researcher



.....

Prof A Kritzinger

Main Supervisor

.....

Dr. Salome Geertsema

Co supervisor

.....

Dr Mia Le Roux

Co supervisor

.....

Prof Van Der Linde

Head: Department of Speech-Language Pathology and Audiology

I, Gopee Ramprakash principal of Stanley Govt school, herewith grant permission to Ms Sattiavany Veerabudren to conduct the study entitled "Grade 4 learners with reading and writing difficulties in Mauritius: characteristics and perspectives" in said school. I have read and understood the content of this information letter.

R. Gopee

Signed

(Official school stamp)

Ministry of Education, Tertiary Education, Science and Technology
17/7/2020
STANLEY GS
ZONE 2

17 July 2020

I, Mrs S. Gujadhur principal of Aimé Césaire GS school, herewith grant permission to Ms Sattiavany Veerabudren to conduct the study entitled "Grade 4 learners with reading and writing difficulties in Mauritius: characteristics and perspectives" in said school. I have read and understood the content of this information letter.

Signed

S. Gujadhur

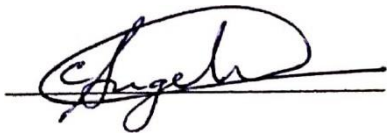
Ministry of Education, Tertiary Education, Science and Technology
AIMÉ CÉSAIRE GS
ZONE 2

(Official school stamp)

14.04.2020

I, ANGELINE clency principal of Sookdeo Bissoondoyal G.S school, herewith grant

Sattiavany Veerabudren to conduct the study entitled "Grade 4 learners with difficulties in Mauritius: characteristics and perspectives" in said school. I have read and understood the content of this information letter.



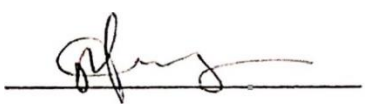
Signed (Official school stamp)

15/07/2020

Date

I, [illegible] principal of J Nehru G-S school, herewith grant

Sattiavany Veerabudren to conduct the study entitled "Grade 4 learners with difficulties in Mauritius: characteristics and perspectives" in said school. I have read and understood the content of this information letter.



Signed (Official school stamp)

15/07/20

Date

I, Re-e.J principal of ß• C.A.'Rosnee G.S school, herewith grant permission to Ms Sattiavany Veerabudren to conduct the study entitled "Grade 4 learners with reading and writing difficulties in Mauritius: characteristics and perspectives" in said school. I have read and understood the content of this information letter.

(Official school stamp)

Signed

15.07.20

Appendix F: Information leaflet and informed consent form for teachers

Teacher Information Leaflet and Informed Consent

Grade 4 learners with reading and writing difficulties in Mauritius: characteristics and perspectives

Principal researcher: Ms Sattiavany Veerabudren

Supervisors: Prof. AM Kritzinger, Dr Salomé Geertsema, Dr Mia Le Roux

Institution: University of Pretoria

DAYTIME TELEPHONE NUMBER(S):

Daytime number/s: 58131162/4645674

DATE AND TIME OF FIRST INFORMED CONSENT DISCUSSION:

				:
Date	**Month**	**Year**		**Time**

Dear Teacher

Introduction

You are invited to participate in a research study titled **"Grade 4 learners with reading and writing difficulties in Mauritius: characteristics and perspectives"** as part of my PhD study in Speech-Language Pathology in the Department of Speech-Language Pathology and Audiology at the University of Pretoria, South Africa. This information leaflet will help you to decide if you want to participate. Before you agree to take part, you should fully understand what is involved. If you have any questions that this leaflet does not fully explain, please do not hesitate to ask the researcher **Ms Sattiavany Veerabudren.**

The nature and purpose of this study

The aim of the study, inter alia, is to describe the perspectives of primary school teachers about reading writing difficulties and Specific Learning Disorder, using a questionnaire. You are invited to participate as you have at least three years of working experience. This study will recruit valuable information about reading writing difficulties from Grade 4 teachers who are usually the first to observe these difficulties in learners. The results may show the difficulties that teachers encounter using the curriculum not adapted to the needs of learners with reading and writing difficulties. The study may help to raise awareness in the education system.

Explanation of procedures to be followed

This study involves completing a questionnaire and two checklists about each learner in your class with and without reading and writing difficulties. The questionnaire consists of three sections regarding your experience about reading and writing difficulties in learners and Specific Learning Disorder. You do not require any specialised knowledge to complete the

questionnaire. I will arrange a date and time at your convenience to complete the questionnaire on the school premises. It will take approximately 20 minutes to complete the questionnaire. Also, you will be asked to complete a screening tool for learning disorder developed and validated by Vidyadharan et al. (2017) and a Clinical Evaluation of Language Fundamentals, 5th edition, teacher observation rating scale checklist which will be used to identify and describe characteristics of learners with RWD in your class.

Risk and discomfort involved

This study does not involve potential risks or administration of harmful substance.

Possible benefits of this study

You will not benefit directly from the study.

What are the rights as a participant?

Your participation in this study is entirely voluntary. You can refuse to participate or withdraw at any time during the study without giving any reason. Your withdrawal will not affect you in any way.

Has the study received ethical approval?

This study has received written approval from the Research and Ethics Committee of the Faculty of Humanities at the University of Pretoria, South Africa, telephone numbers (+27) 12 356 3084 /(+27) 12 356 3085.

Information and contact person

If you would like further information on the research study, please contact us at:
Researcher: Ms Sattiavany Veerabudren (Speech-Language Therapist and researcher)
Contact No.: (+230) 58131162 / 4645674
Email: sattiavany92@gmail.com
Alternatively, you may contact my supervisors at:
Prof. Alta Kritzinger:alta.kritzinger@up.ac.za
Dr SalomeGeertsema:salome.geertsema@up.ac.za
Dr Mia le Roux:mia.leroux@up.ac.za

Compensation

Your participation is voluntary. No compensation will be given for your participation.

Confidentiality

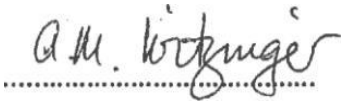
All information obtained during the duration of this study will be regarded as confidential. Each participant will be provided with an alphanumeric coded number e.g. A001. This will ensure confidentiality of information collected. Only the researcher will be able to identify you as participant. Results will be published or presented in such a fashion that participants and their schools remain unidentifiable. The hard copies of all your records will be kept in a locked facility for 15 years at the Department of Speech-Language Pathology and Audiology, University of Pretoria, South Africa.

Thank you very much for your consideration.

Yours sincerely

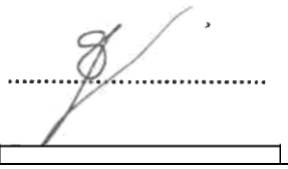
.....

Sattiavany Veerabudren

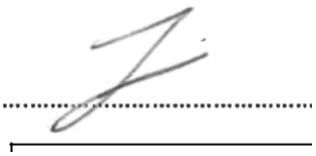


Prof. A Kritzinger

Dr M ie Roux



Dr S. Geetzema



Prof. J Van der Linde Head of Department Speech-Language Pathology and Audiology

Appendix G: Information leaflet and informed consent form for parents of children with reading and writing difficulties

From: **Sattiavany Veerabudren**

Speech-Language Therapist & Audiologist

Bsc & Msc Audiology and Speech-Language Pathology

Manipal Academy of Higher Education, Manipal, India

19, Charles de Gaule, Rose Hill, Mauritius, Indian Ocean

Tel:+230 58131162 Email: sattiavany92@gmail.com

To: Mr/Mrs……..

…….

Dear Parent,

Request permission and contact number for a research study

I, Miss S. Veerabudren is a Speech Language Therapist currently working on a thesis titled **"Grade 4 learners with reading and writing difficulties in Mauritius: Characteristics and Perspectives"** as part of my PhD programme in Speech-Language Pathology in the Department of Speech-Language Pathology and Audiology at the University of Pretoria, South Africa. I have received the approval from the Ministry of education, Tertiary Education, Science and Technology. During a screening process among Grade 4 learners at……. (school name) Government school using a standardised and validated screening tool for learning disorder, your child Minor …….. (learner's name) has been identified with significant difficulties with respect to his/her reading and writing skills. I would appreciate if I could contact you to have more information about your child's difficulties and to request for your consent for you and your child to participate in this study.

Attached to this letter is the parent information sheet with all the details regarding the study. If you are interested and willing to participate kindly sign the informed consent and provide your contact number. You may wish to contact me on the number provided in the information sheet for any further queries.

Thanking you in advance for your consideration.

Yours sincerely,

S. Veerabudren (Miss)

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Parent Information Leaflet and Informed Consent

Grade 4 learners with reading and writing difficulties in Mauritius: Characteristics and perspectives

Principal researcher: Ms Sattiavany Veerabudren

Supervisors: Prof. AM Kritzinger, Dr. Salomé Geertsema, Dr. Mia le Roux

Institution: University of Pretoria, South Africa

DAY TIME TELEPHONE NUMBER(S):

Daytime number/s: 58131162/4645674

DATE AND TIME OF FIRST INFORMED CONSENT DISCUSSION:

				:
Date	**Month**	**Year**		**Time**

Dear Parent

Introduction

You are invited to participate in a research study titled **"Grade 4 learners with reading and writing difficulties in Mauritius: Characteristics and Perspectives"** as part of my PhD study in Speech-Language Pathology in the Department of Speech-Language Pathology and Audiology at the University of Pretoria, South Africa. This information leaflet will help you to decide if you want to participate. Before you agree to take part, you should fully understand what is involved. If you have any questions that this leaflet does not fully explain, please do not hesitate to ask the researcher **Ms Sattiavany Veerabudren.**

The nature and purpose of this study

The aim of the study is to describe the parental perspectives of Grade 4 learners with reading and writing difficulties in Mauritius, using a questionnaire to collect information. You are invited to participate because your child has been identified with a reading writing difficulty based on a screening process using the screening tool for learning disorder by Vidyadharan et al., 2017. Only learners who scored ≥10 on the screening tool for learning disorder (Vidyadharan et al., 2017) were included in this study. Hence, I would like your permission to assess your child's reading and writing difficulties using two standardised English tests for reading and spelling skills. This study will recruit valuable information about the characteristics of reading writing difficulties in Grade 4 learners.

Explanation of procedures to be followed

This study, as part of my larger PhD study, involves completing a questionnaire about your child's reading and writing difficulties. The questionnaire comprises of questions related to the following areas of interest using both close-ended and open-ended questions: (1) Parents' perspectives on reading and writing difficulties in their children (the different domains affected

and the contributing factors). (2) The parental experiences of children with reading and writing disorders. (3) Parental descriptions of the development of emergent literacy skills in their children (their observations during language development, how was their child's writing and reading development, their involvement in their child's emergent and early literacy development and scholastic performance.4) Parental willingness to seek early diagnosis and intervention if their child has a reading and writing disorder.You do not require any specialised knowledge to complete the questionnaire. I will arrange a date, time and place at your convenience to complete the questionnaire. It will take approximately 20 minutes to complete the questionnaire.

I would like to also request your consent to administer two standardised tests on your child to investigate his/her reading and writing characteristics in English. Your child will be tested individually in a quiet room.

Risk and discomfort involved

This study does not involve potential risks or administration of harmful substances.

Possible benefits of this study

You will not benefit directly from the study.

What are the rights as a participant?

Your participation in this study is entirely voluntary. You can refuse to participate or withdraw at any time during the study without giving any reason. Your withdrawal will not affect you in any way.

Has the study received ethical approval?

This study has received written approval from the Research and Ethics Committee of the Faculty of Humanities at the University of Pretoria, South Africa, telephone numbers (+27) 12 356 3084 / (+27) 12 356 3085.

Information and contact person

If you would like further information on the research study, please contact us at:

Researcher: Ms Sattiavany Veerabudren (Speech-Language Therapist and researcher)

Contact No.: (+230) 58131162 / 4645674

Email: sattiavany92@gmail.com

Alternatively, you may contact my supervisors at:

Prof. Alta Kritzinger:alta.kritzinger@up.ac.za

Dr Salome Geertsema:salome.geertsema@up.ac.za

Dr Mia le Roux: mia.leroux@up.ac.za

Compensation
Your participation is voluntary. No compensation will be given for your participation.

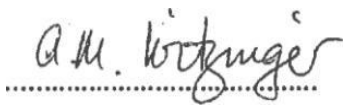
Confidentiality
All information obtained during the duration of this study will be regarded as confidential. Each participant will be provided with an alphanumeric coded number e.g. A001. This will ensure confidentiality of information collected. Only the researcher will be able to identify you as participant. Results will be published or presented in such a fashion that participants and their schools remain unidentifiable. The hard copies of all your records will be kept in a locked facility for 15 years at the Department of Speech-Language Pathology and Audiology, University of Pretoria, South Africa.

Thank you very much for your consideration.

Yours sincerely,

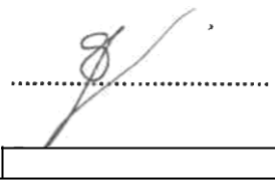
……..

Sattiavany Veerabudren

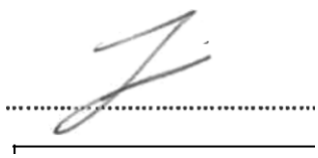


Prof A Kritzinger

Dr M ie Roux



Dr S. Geetzema



Prof. J Van der Linde

Head of Department Speech-Language Pathology and Audiology

INFORMED CONSENT

I confirm that the person asking my consent to take part in the study titled "**Grade 4 learners with reading and writing difficulties in Mauritius: Characteristics and perspectives"** has told me about the nature, process, risks, discomforts and benefits of the study. I have also received, read and understood the above written information (Parent Information Sheet and Informed Consent) regarding the study. I am aware that the results of the study, including personal details will be anonymously processed into research reports. I am participating willingly. I have had time to ask questions and have no objection to participate in the study. I understand that there is no penalty should I wish to discontinue with the study and my withdrawal will not affect me in any way.

I have received a signed copy of this informed consent agreement.

Parent name …….....

Parent signature .....…….

Parent contact number ……

Date .....

Investigator's name .....……..

Investigator's signature .....…….

Date ….....

Appendix H: Information leaflet and informed consent form for parents of children without reading and writing difficulties

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Faculty of Humanities

Department of Speech-Language Pathology and Audiology

Parent information and informed consent for learners without reading writing difficulties

Date	**Month**	**Year**

Principal researcher: Ms Sattiavany Veerabudren

Supervisors: Prof. AM Kritzinger, Dr Salome Geertsema, Dr Mia le Roux

Institution: University of Pretoria, South Africa

DAY TIME TELEPHONE NUMBER(S):

Daytime number/s: 58131162/4645674

DATE AND TIME OF FIRST INFORMED CONSENT DISCUSSION:

:
Time

Dear Parent

Introduction
You are invited to participate in a research study titled **"Grade 4 learners with reading and writing difficulties in Mauritius: characteristics and perspectives"** as part of my PhD study in Speech-Language Pathology in the Department of Speech-Language Pathology and Audiology at the University of Pretoria, South Africa. This information leaflet will help you to decide if you want to participate. Before you agree to take part, you should fully understand what is involved. If you have any questions that this leaflet does not fully explain, please do not hesitate to ask the researcher **Ms Sattiavany Veerabudren.**

The nature and purpose of this study
The aim of the study is to compare the characteristics of Grade 4 learners with and without reading writing difficulties in Mauritius. You are invited to participate because your child does not have any reading writing difficulty based on a screening process and could be part of the control group.

Hence, I would like your permission to assess your child's reading and writing difficulties using two standardised English tests for reading and spelling skills. The results will be compared to children with reading and writing difficulties. This study will recruit valuable information about the characteristics of reading writing difficulties in Grade 4 learners.

Explanation of procedures to be followed
Two standardised tests will be used to investigate the reading measures in English. Your child will be tested individually in a quiet room.

Risk and discomfort involved
This study does not involve potential risks or administration of harmful substances.

Possible benefits of this study
You will not benefit directly from the study.

What are the rights as a participant?
Your permission for your child to participate in this study is entirely voluntary. You can refuse to participate or withdraw at any time during the study without giving any reason. Your withdrawal will not affect you in any way.

Has the study received ethical approval?
This study has received written approval from the Research and Ethics Committee of the Faculty of Humanities at the University of Pretoria, South Africa, telephone numbers (+27) 12 356 3084 / (+27) 12 356 3085.

Information and contact person
If you would like further information on the research study, please contact us at:

Researcher: Ms Sattiavany Veerabudren (Speech-Language Therapist and researcher)

Contact No.: (+230) 58131162 / 464567

Email: sattiavany92@gmail.com

Alternatively, you may contact my supervisors at:

Prof. Alta Kritzinger:alta.kritzinger@up.ac.za

Dr Salome Geertsema:salome.geertsema@up.ac.za

Dr Mia le Roux: mia.leroux@up.ac.za

Compensation
The participation is voluntary. No compensation will be given for participating.

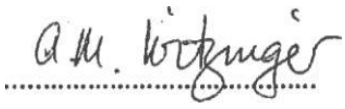
Confidentiality
All information obtained during the duration of this study will be regarded as confidential. Each participant will be provided with an alphanumeric coded number e.g. A001. This will ensure confidentiality of information collected. Only the researcher will be able to identify your child as a participant. Results will be published or presented in such a fashion that participants and their schools remain unidentifiable. The hard copies of all your records will be kept in a locked facility for 15 years at the Department of Speech-Language Pathology and Audiology, University of Pretoria, South Africa

Thank you very much for your consideration.

Yours sincerely

.....

Sattiavany Veerabudren



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Prof. A Kritzinger

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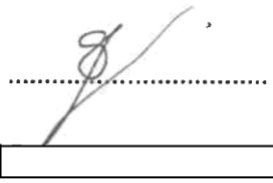
Dr M ie Roux



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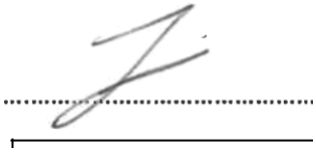
Dr S. Geetzema



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Prof. J Van der Linde

Head of Department Speech-Language Pathology and Audiology

INFORMED CONSENT

I confirm that the person asking my consent to take part in the study titled "**Grade 4 learners with reading and writing difficulties in Mauritius: Characteristics and perspectives"** has told me about the nature, process, risks, discomforts and benefits of the study. I have also received, read and understood the above written information (Parent Information Sheet and Informed Consent) regarding the study. I am aware that the results of the study, including personal details will be anonymously processed into research reports. I am participating willingly. I have had time to ask questions and have no objection to participate in the study. I understand that there is no penalty should I wish to discontinue with the study and my withdrawal will not affect me in any way.

I have received a signed copy of this informed consent agreement.

Parent name …….....

Parent signature .....……..

Date .....

Investigator's name .....……

Investigator's signature .....……..

Date ….....

Appendix I: Teacher Questionnaire

Teacher Questionnaire

Questionnaire number ☐

Dear participant

Thank you for agreeing to participate in my study "**Teachers' perspectives regarding learners with**

reading and writing difficulties in Mauritius". Please answer all questions as best as you can.

Reading and writing difficulties in learners, or when formally diagnosed as Specific Learning Disorder, show as persistent difficulties in reading, writing, or mathematical reasoning skills during formal years of schooling. As a result, the learner's academic skills are below the average range of scores in all culturally and linguistically appropriate tests of reading, writing, or mathematics. The learner's difficulties are not explained by any developmental, neurological, sensory (vision or hearing), or motor disorders and significantly interfere with academic achievement, or activities of daily living (American Psychological Association [APA], 2013).

Section I: Demographic and background information

1. **Please indicate the languages that you know:** Mauritian Creole 1. ☐ 2. French ☐ 3. English ☐ 4. 0ther, please specify ……

2. **Teaching Language:** 1. Mauritian Creole ☐ 2. French ☐ 3. English ☐

3. **Your age in years:**

4. **Gender:** 1. Male ☐ 2. Female ☐

5. **Name of your school:**

6. **Location:** 7. **Division:** 8. **Zone:**

1. **Number of learners in your class:**

10. **Your highest education level:**

1. School Certificate ☐

2. High School Certificate ☐

3. Bachelor's degree in any field ☐

4. Bachelor's degree in education ☐

5. Diploma in Teaching ☐

6. Post-graduate Degree (Masters/PhD)

11. **Which subjects do you teach?**

1. General subjects (English, French, Mathematics, Sciences, History, Geography) ☐

2. Non-academic subjects ☐

3. Asian Languages /Mauritian Creole ☐

12**.Years of teaching experience:**

1. 0 to 5 years ☐ 2. 6 to 10 years ☐ 3. 11 to 20 years ☐ 4. 21 to 30 years

5. 31 years or more ☐

13. **During your teaching years, did you receive any information regarding the role of an audiologist and speech-language therapist in schools?**

1.Yes ☐ 2. No ☐ 3. I do not remember ☐ 4. I do not know ☐

14. **During your teacher training, did you receive any orientation about various communication disorders and reading writing difficulties?**

1.Yes ☐ 2. No ☐ 3. I do not remember ☐ 4. I do not know ☐

15. **Have you ever encountered any learner with reading and writing difficulties or Specific Learning Disorder in your teaching career?**

1. Yes ☐ 2. No ☐ 3. I am not sure ☐

Section II: Your perspectives on learners with reading and writing difficulties

16. **In your opinion, which of the following can contribute to reading and writing difficulties?**

16.1 Intellectual disability ☐

16.2 Lack of parent or family involvement in the child's education ☐

16.3 Lack of interest in the child ☐

16.4 Genetic factors ☐

16.5 Behaviour problems ☐

16.6 Attention deficits ☐

16.7 Hearing difficulties ☐

16.8 Poor vision ☐

16.9 Teaching methods used by teachers or schools ☐

16.10 Do not know ☐

16.11 Other, Please specify……

17. **Please tick all the terms you are familiar with:**

17.1 Dyslexia ☐

17.2 Dyscalculia ☐

17.3 Phonological disorder ☐

17.4 Dysgraphia ☐

17.5 Central auditory processing disorder ☐

17.6 Attention deficit hyperactivity disorder or ADHD ☐

17.7 Slow learner ☐

17.9 Specific Learning Disorder ☐

17.9 I do not know any of the terms mentioned above

18.Please tick the appropriate box to indicate how much you agree with the statement next to it. If you are not sure which box to tick, please tick the box which is most closely related to your view.

Statements	Strongly agree (1)	Agree (2)	Disagree (3)	Strongly disagree (4)
1. I have enough knowledge of the definition of reading and writing difficulties to identify learners with learning difficulties.				
2. I have enough knowledge about the treatment of reading and writing difficulties to be able to support them.				
3. A learner can outgrow a reading and writing difficulty				

4. One cannot identify a Reading and writing difficulty until a learner is eight years old.				

Section III: Your attitude towards learners with reading writing difficulties

19.Please tick the appropriate box to indicate how much you agree with the statement next to it. If you are not sure which box to tick, please tick the box which is most closely related to your view.

Statements	Strongly agree (1)	Agree (2)	Disagree (3)	Strongly disagree (4)
1. Learners with reading and writing difficulties are good at art, music, drama, sports, design.				
2. Learners with reading and writing difficulties are more creative than other learners, which allow them to overcome their difficulties.				
3. Learners with reading and writing difficulties try harder to read than other learners.				
4. Most learners with reading and writing difficulties try to complete their classwork and homework.				
5. It is most likely that learners with reading and writing difficulties will show behaviour problems in regular classrooms				
6. Regular classroom teachers have the knowledge and skills to assist learners with reading and writing difficulties.				
7. Learners with reading and writing difficulties should be enrolled and follow up in appropriate special education need schools.				
8. Regular classroom teachers do not have enough training to teach learners with reading and writing difficulties.				
9. Learners with reading and writing difficulties are best served in regular classrooms.				
10. Integration of learners with reading and writing difficulties offers mixed group interaction that will foster the understanding and acceptance of differences among learners.				
11. The challenge being in regular classroom will promote the academic growth of learners with reading and writing difficulties.				

Statements	Strongly Agree (1)	Agree (2)	Disagree (3)	Strongly Disagree (4)
1. The behaviour of learners with reading and writing difficulties will set a bad example for learners without disabilities.				
2. Learners with reading and writing difficulties are likely to create confusion in regular classroom.				
3. Integration of learners with reading and writing difficulties will require extensive retraining of regular classroom teachers.				
4. Learners with reading and writing difficulties will monopolize the regular classroom teacher's time.				
5. The extra attention learners with reading and writing difficulties require will be to the detriment of the other learners.				
6. Learners with reading and writing difficulties are socially isolated in the regular classroom.				
7. Isolation in a special classroom has a beneficial effect on the social and emotional development of the learners with reading and writing difficulties				
8. Assignments should be modified for learners with reading and writing difficulties.				
9. I would welcome learners with reading and writing difficulties in my classroom and would work with them.				
10. Modification of coursework for learners with reading and writing difficulties would be difficult to justify to other learners.				
11. The future for literacy achievement for learners with reading and writing difficulties is very limited.				

20.**When you suspect a reading and writing problem in a learner, who (professional) or where do you refer the learner to?**

20.1 School principal ☐

20.2 Psychologist☐

20.3 Occupational therapist☐

20.4 Speech-language therapist ☐

20.5 Audiologist☐

20.6 Support teachers ☐

20.7 Other, please mention.....

21.**How would you help a learner with reading writing difficulties?**

21.1 Correction - tell the learner where the mistake is and ask him/her to redo it ☐

21.2 Repetition exercises ☐

21.3 I suggest challenging exercises ☐

21.4 Encourage active involvement in class discussion and activities ☐

21.5 Extra tuition ☐

21.6 I do not know ☐

21.7 Others, Please explain ☐

……

……

……

22.**According to you, what are some support strategies that may assist learners with reading writing difficulties in regular schools?**

……

……

……

Thank you very much for your participation!!!

Appendix J: Parent Questionnaire

Parent Questionnaire

Questionnaire number: ☐

Dear Parent

Thank you for agreeing to participate in this research study. I would like to ask you a few questions about your child with reading and writing difficulties. I value your answers as you know your child best. As a researcher, I would like to know more about how parents view their child's reading and writing difficulties, so that we can work out ways how best to support families.

The following questionnaire will require approximately 15 minutes to complete. Please answer all questions as honestly as possible and return the completed questionnaire promptly. In order to ensure that all information will remain confidential, please do not include your name.

Instructions: Please mark the appropriate options for each question.

Section I: Demographic information of the family of the child with reading and writing difficulties

1.Person completing the questionnaire

Mother (1) ☐ Father (2) ☐ Legal guardian (3) ☐

2.Language used at home:

Mauritian Creole (1) ☐ French (2) ☐ English (3) ☐

0ther, please specify …….. (4)

3.Your age in years:

20-30 (1) ☐ 31-40 (2) ☐ 41-50 (3) ☐

4.Gender

Male (1) ☐ Female (2) ☐

5.Place of living:

Urban (1) ☐ Rural (2) ☐

6.Your highest education qualification:

Cambridge School Certificate (1) ☐ Cambridge High School Certificate (3) ☐

Graduate (2) ☐ Graduate degree (4) ☐

7.Number of living children in your family:

1(1) ☐ 2 (2) ☐ 3(3) ☐

8.Conditions in the family such as psychiatric illness, Intellectual Disability, Autism, Specific Learning Disorder

Yes (1) ☐ No (2) ☐

Section II: Questions regarding your child's reading and writing

9.How is your child's scholastic performance?

Poor (1) ☐ Satisfactory (2) ☐ Good (3) ☐ Very good (4) ☐

10.How are your child's reading and writing skills?

Poor (1) ☐ Satisfactory (2) ☐ Good (3) ☐ Very good (4) ☐

11.Could you please explain in your own words what your child's difficulties are?

……
……
……

12.According to you, what are the reasons your child is experiencing difficulties in learning how to read and write? You may mark more than one option.

12.1 My child is not interested in learning how to read and write ☐

12.2 My child just seems to be lazy ☐

12.3 My child has intellectual difficulties ☐

12.4 My child has a specific learning disorder such as dyslexia, dysgraphia ☐

12.5 My child has an underlying medical condition, please state the condition……

12.6 My child has a hearing difficulty ☐

12.7 My child has a visual difficulty ☐

12.8 Poor teaching methods ☐

12.9 Mismatch between the home language and the language of teaching and learning ☐

12.10 I do not know ☐

12.11Other,please explain……☐

13.Was your child born preterm and with low birth weight?

Yes (1) ☐ No (2) ☐

14.Did your child spend more than five days in hospital after birth?

Yes (1) ☐ No (2) ☐

15.Did your child have feeding difficulties as a baby?

Yes (1) ☐ No (2) ☐

16.Do you suspect any hearing difficulties in your child?

Yes (1) ☐ No (2) ☐

17.Did you child experience any speech and language problems as a toddler?

Yes (1) ☐ No (2) ☐

18.Did your child attend Kindergarten?

Yes (1) ☐ No (2) ☐

19.At what age did he/she start Kindergarten?

2-3years (1) ☐ 3-4 years (2) ☐ 4-5years (3) ☐

20.Do you help your child with schoolwork at home?

Yes (1) ☐ No (2) ☐

21.Please mark everything your child has trouble with:

Reading	**Yes (1)**	**No (2)**
21.1 Trouble sounding out words when he/she is reading		
21.2 Trouble understanding what he/she has read		
21.3 Trouble explaining what he/she has read		
21.4 Trouble identifying the main ideas in something he/she has read		
21.5 Trouble remembering details of something he/she has read		
21.6 Trouble following directions		
Writing		
21.7 Uses poor grammar while writing		
21.8 Trouble writing complete sentences		
21.9 Write short and choppy sentences		
21.10 Trouble putting words in the right order when writing sentences		
21.11 Trouble putting words in the right order when writing sentences		
21.12 Trouble expanding an answer and providing details when writing		

22.In which language does he/she show more difficulties in reading and writing?

English (1) ☐ French (2) ☐ Both (3) ☐

23. How do you help your child to overcome those difficulties?

23.1 I send him/her for private tuition lessons

23.2 I work together with the class teacher to find a solution

23.3 I consulted a professional such as speech-language therapist and educational psychologist for therapy

23.4 I try to help him/her myself everyday with the homework

23.5 I am not doing anything right now

24.Do you think there are intervention options for learners with reading writing difficulties in

Mauritius?

Yes (1) ☐ No (2) ☐

25. Are you seeking intervention for your child regarding his/her reading writing difficulties?

Yes (1) ☐ No (2) ☐

26.Who are the professionals you think can help your child?

26.1 Educational Psychologist ☐

26.2 Speech-Language Therapist ☐

26.3 Occupational Therapist ☐

26.4 Special Educator ☐

26.5 Paediatrician ☐

26.6Other,please indicate …… ☐

The End

Thank you very much for your participation!

Appendix K: Screening Tool for Learning Disorder

Participant number: ……..

Participant's date of birth ……. Age……years ……..months

Screening tool for learning disorder in children

Vidyadharan, V., Tharayil, H. M., & George, B. (2017). Validation of a screening tool for learning disorder in children. *Indian Journal of Psychological Medicine*, *39*(6), 737-740.

Questions	Yes	No
1. Are the academic abilities of the child below than expected for his/her age, class, and intellectual capacity?		
2. Are these deficits due to family / environmental adversities?		
3. Are these deficits due to poor ability to attend / over-activity in the child?		
4. Are these deficits due to poor motivation / effort from the child?		
5. Are there mistakes while reading? (Omit words / substitute words / add words / skips lines).		
6. Are there difficulties in differentiating letters and their corresponding sounds? (Example: in English - E for I, CH for SH)		
7. Does the child frequently engage in guess reading?		
8. Is it difficult for the child to understand the meaning of what is read? (Sequence, relationship and inference of words read)		
9. Does the child prefer being read to than reading by self?		
10. Does the child frequently have difficulty in identification of letters, signs and symbols?		
11. Does the child confuse similar looking words / letters?		
12. Does the child answer well orally, but fail to do the same in writing?		
13. Are there frequent spelling mistakes in writing?		
14. Are there unequal spacing between letters / words?		
15. Are there frequent mistakes in writing? (Grammatical errors, punctuation errors, poor paragraph organisation)		
16. Does the child omit / add / substitute either letters or words in writing?		

17. Does the child tend to spell words as they are pronounced? (Example: rong for wrong etc.)		
18. Does the child write or read figures or letters incorrectly? (Example: 15 for 51, 6 for 9, b for d)		

Questions	**Yes**	**No**
19. Does the child have difficulty with upper- and lower-case letters while writing words (Example, writes better as beTTeR).		
20. Does the speech of the child lack clarity? (Pronunciation difficulties)		
21. Does the child have difficulty to follow a long oral instruction?		
22. Does the child have difficulty with spatial orientation / direction? (Example, confuses left / right; east / west; up / down etc.)		
23. Does the child have difficulty in understanding the concept of numbers?		
24. Does the child have difficulty in simple counting?		
25.Does the child have difficulties in basic arithmetic calculations?		
26. Does the child have difficulty with problem solving during any task?		
Total	**/26**	

Screening results: Pass Fail

Scoring details: The Screening Tool for Learning Disorder developed and validated by Vidyadharan et al. (2017).

Each yes will be scored as 1 mark. A cut-off score ≤10 can rule out the existence of a learning difficulty. A score of 11–20 requires an assessment to confirm SLD. A score of >20 indicates that the learner most likely at high risk of having RWD or SLD

Appendix L: Assent form for Grade 4 learners with and without reading and writing difficulties

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Faculty of Humanities

Department of Speech-Language Pathology and Audiology

Assent form for Grade 4 learners with and without reading and writing difficulties

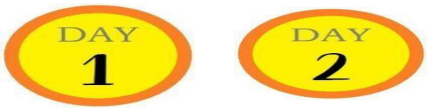
You will show me how good your hearing is.

I will give you a short story to read and ask you few questions on what you read

I will tell you some words which you will have to write

Each time won't take too long – not more than an hour. We will of course have some breaktime. If you want to stop, just say "Stop" and we can finish up. Now, if you are happy to take part in this activity, please put a tick in the boxes:

The research has been explained to me 	
I understand what I will have to do and I am happy to do these jobs. 	

I understand we are going to meet 2 times to do these activities together 	
I am happy for my voice to be recorded 	

I understand that I can ask questions at any time 	
I can decide to stop and finish. 	

…….. …….. ……

Signature or Cross of Minor Printed Name of Minor Date

Witness to Assent:

I certify that I was present for the discussion and that the subject had an opportunity to ask questions, appeared to understand the information presented and agreed to participate voluntarily in the research.

……. ……. ……

Signature of Person Printed Name of Person Date

Witnessing Assent Witnessing Assent

Appendix M: Approval letter from Research Ethics Committee, Faculty of Humanities, University of Pretoria

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Fakulteit Geesteswetenskappe
Lefapha la Bomotho

Humanities 100
Since 1919

27 July 2020

Dear Ms S Veerabudren

Project Title:	Grade 4 learners with reading and writing difficulties in Mauritius: Characteristics and perspectives
Researcher:	Ms S Veerabudren
Supervisor(s):	Dr A Kritzinger Dr S Geertsema Dr M le Roux
Department:	Speech Language Path and Aud
Reference number:	19380969 (HUM018/0520)
Degree:	Doctoral

I have pleasure in informing you that the above application was **approved** by the Research Ethics Committee on 27 July 2020. Data collection may therefore commence. Please note that this approval is based on the assumption that the research will be carried out along the lines laid out in the proposal. Should the actual research depart significantly from the proposed research, it will be necessary to apply for a new research approval and ethical clearance.

We wish you success with the project.

Sincerely,

Prof Innocent Pikirayi

Deputy Dean: Postgraduate Studies and Research EthicsFaculty of Humanities

UNIVERSITY OF PRETORIA

e-mail: PGHumanities@up.ac.za

Appendix N: Referral letter for learners with reading and writing difficulties

UNIVERSITEIT VAN PRETORIA
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Faculty of Humanities

Department of Speech-Language Pathology
and Audiology

March 2020

Dear Parent

Child's name: _____

You gave permission for your child to participate in the research study **"Grade four learners with reading and writing difficulties in Mauritius: characteristics and perspectives"**. As discussed with you during feedback about your child's reading and writing characteristics, I recommend that you see a professional for further assessment and possible intervention. The names are just a suggestion and you are welcome to use any service provider of your choice.

Problem area	Profession	Professionals to consult	Refer: Yes / No
Reading and writing difficulties	Psychologist	Dr Meryl Chung Corommandel +230 59457115 Mr Joffrey Bodet Centre Libellule, Ebene +230 59402580	

Speech and Language difficulties and reading writing difficulties	Speech-Language Therapist	Mrs Divya Bissessur Teja Centre Libellule, Ebene +230 59027600	
Hearing difficulty/ Auditory processing difficulties	Audiologist	Dr Rachna Gopal Welkin Hospital, Moka +230 52534747	
Writing difficulties	Occupational Therapist	Ms YD Kiran Seeboruth Vacoas +230 59261198	

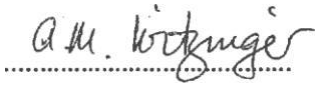
Thank you for participating in the study. Please contact me should you require more information.

Yours Sincerely,

……

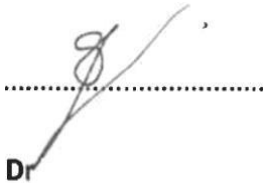
Sattiavany Veerabudren

Researcher



Prof A Kritzinger

Main Supervisor

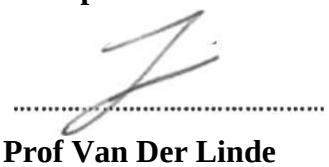


Dr. Salome Geertsema

Co supervisor

Dr Mia Le Roux

Co supervisor



Prof Van Der Linde

Head: Department of Speech-Language Pathology and Audiology