Meeting the Needs of Students:
What teachers know about developmental language disorder and inclusive practices

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Abstract

Australian teachers are required to implement reasonable adjustments to ensure access to the curriculum for all students with disability, including those with Developmental Language Disorder (DLD). Students with DLD and their teachers are faced with significant challenges to achieving successful participation, access, and academic progress in the school context as language is the currency for learning and socialising. DLD is a common and persistent disorder, yet complex and hidden. Knowledge of DLD is an essential link in the knowledge chain necessary for teachers to implement appropriate adjustments. This project aims to understand what Australian teachers know about students with DLD using survey methodology. This research finds a mismatch between participants' self-rated and actual knowledge of DLD (n=262). Most participants also had difficulty interpreting students' presenting characteristics and selecting appropriate adjustments in classroom-based scenario tasks. Teacher years of experience, training exposure, and speech pathology support were positively associated with self-rated knowledge, but not identification accuracy.

Table of Contents

List of Figures

List of Tables

List of Abbreviations

AITSL – Australian Institute for Teaching and School Leadership

DLD – Developmental Language Disorder

DDA – Disability Discrimination Act

DSE – Disability Standards for Education

IE – Inclusive Education

NCCD – Nationally Consistent Collection of Data on School Students with Disability

SLCN – Speech Language and Communication Needs

UNCRC – United Nations Convention on the Rights of the Child

UNDHR – United Nations Declaration of Human Rights

Statement of Original Authorship

The work contained in this thesis has not been previously submitted to meet requirements for an award at this or any other higher education institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made.

Signature: QUT Verified Signature

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Chapter 1: Introduction

Language is like the air that we breathe:

Ever present and life-giving, yet invisible and taken for granted.

Professor Pamela Snow, 2012

Developmental Language Disorder (DLD) is the most common disorder you have never heard of (Bishop et al., 2017). Students with DLD make up approximately 7% of the population yet DLD is a largely unknown term amongst the general public (Norbury et al., 2016). DLD has significant impact on life and learning however it is not easily recognised by teachers (Adlof et al., 2017; Antoniazzi et al., 2010) While they might identify concerns for a student's learning progress, DLD is not often a cause explored. This can leave both students with DLD and their teachers feeling perplexed, confused and frustrated.

These situations exist for two main reasons: (1) DLD is common but misunderstood and (2) language is the basis for learning and teaching. Pablo Picasso has said that "there is only one way to look at things until someone shows us how to look at them differently". This study is one small step on the journey of understanding how teachers currently *look* at students with DLD, and the knowledge they have about students with DLD. The outcomes of this investigation may then give guidance to help teachers to look at students with DLD *differently* in order to support them better.

This introductory chapter provides an overview of the issue of limited awareness and understanding of DLD in the educational context. The initial section explains DLD – what it is, the current definition, its key characteristics, its

relationship to other communication disorders, clarification of terminology, and the general impacts of living with DLD. The focus then narrows to DLD within the educational context, as the central tenant of this proposed project is teacher knowledge of DLD. Consideration is given to the benefit and potential of increased teacher awareness and knowledge of DLD, and the implications for improving inclusive practice. The purpose, significance and scope of the proposed project are then outlined. The chapter concludes with an overview of the thesis structure.

Background of Developmental Language Disorder

Developmental Language Disorder (DLD) is a persistent disorder of language with no obvious cause, characterised by a "profile of difficulties that causes functional impairment in everyday life and is associated with poor prognosis" (Bishop et al., 2017, p. 1068). DLD is differentiated from Language Disorder, which is the term used when the profile of difficulties is "part of a more complex pattern of impairments" such as brain injury, cerebral palsy or Autism Spectrum Disorder (Bishop et al., 2017, p. 1071). Developmental Language Disorder is a recently endorsed diagnostic term. A two-phase Delphi study in 2016 was used, involving a panel of professionals from ten different disciplines, to determine international and inter-professional agreement on the term Developmental Language Disorder and the associated diagnostic criteria. (Bishop et al., 2016, 2017).

While the outcome of the CATALISE studies have made major positive contributions to the field of childhood language difficulties, relevant limitations need to be acknowledged. The authors recognise that educators are key sources of support for children with DLD, however only two teachers were part of the Delphi panel (Bishop et al., 2016). Further, while the authors advocate for a focus on functional impact of the disorder, they are aware that there are few valid measures of

functional impact (Bishop et al., 2017). Similarly, they recognise that consensus was not reached with regard to subgroups that represent specific linguistic profiles. It must be acknowledged, that while consensus was reported as an outcome of these studies, debates persist across the speech pathology profession about the adjustment to terminology and diagnostic criteria (Owen van Horne et al., 2018; Volkers, 2018). Despite study limitations and ongoing debate, the conceptual model of Language Disorder, terminology and diagnostic approach proposed by the CATALISE papers have been adopted by a number of peak professional bodies (e.g., Royal College of Speech Language Therapists, Speech Pathology Australia, The Association of Child and Adolescent Mental Health). Developmental Language Disorder (DLD) is therefore both the conceptual model and diagnostic term used in this study.

DLD is now known as a common condition, that is relatively unknown, regularly missed and largely misunderstood (Law et al., 2017; Lee, 2013). Most recent research estimates DLD to affect approximately 7% of the population, which equates to approximately two students in every class of 30 (Norbury et al., 2016). This statistic would suggest that every teacher, every year, will be a teacher of a student with DLD. Despite its prevalence, DLD is relatively unknown compared to the public awareness of other conditions, such as Autism Spectrum Disorder, Attention Deficit Hyperactivity Disorder, and dyslexia (Royal College of Speech Language Therapists, 2017, Jan 26). The combination of high incidence, low awareness and significant impacts of DLD has prompted Law and colleagues to assert that DLD meets the requirements to be considered a public health concern, requiring government attention and funding (Law et al., 2017; Law et al., 2013). This need is yet to be acknowledged in Australia.

Limited awareness of DLD is concerning, not only because it is common, but because language is a fundamental element of being human (Lee, 2013; Queensland University of Technology Student Engagement Learning and Behaviour Research Group, 2017). Language has been likened to the air that we breathe: ever present and life giving, yet invisible and often taken for granted (Snow, 2012). Without language proficiency, a person's ability to engage in many activities of daily functioning is limited (Law et al., 2017; Lee, 2013). We need language to interact, to establish social belonging, to make requests and have our basic needs met, to process and share our thoughts, to regulate our behaviour, to engage in internal dialogue and to problem solve, as well as participate and benefit from learning activities (Law et al., 2017; Lee, 2013; Snow, 2012). Limited language competence therefore means that a person's ability to successfully engage, develop and learn is at risk (Law et al., 2017; Lee, 2013; Snow, 2016; Snow & Powell, 2011). In turn, these early developmental impacts can compound, affecting a person's life course trajectory (Law et al., 2017; Lee, 2013).

Although the term Developmental Language Disorder has only come into use in recent years, there have been many studies investigating the same language difficulties by a host of other terms, that have illustrated its wide ranging and significant impacts (Law et al., 2017; Lee, 2013). Studies have shown that the majority of students with DLD reach lower levels of academic attainment than their peers, across primary and secondary settings (Conti-Ramsden et al., 2009; Dockrell et al., 2007; Durkin et al., 2015). This is because language is the primary mode through which learning and teaching take place. Therefore, students with DLD experience greater difficulty accessing and participating in education than their peers.

Students with DLD are also at higher risk of reading and writing difficulties, as these are higher-level language-based skills (Law et al., 2017; Lee, 2013; Snow, 2016). Difficulties with literacy further limit these students' access to the curriculum and academic success (Serry et al., 2008; Snow, 2016). Beyond school, longitudinal studies have shown that post-secondary academic and vocational opportunities are also curtailed as a result of the compounding impact of limited language competence and insufficient literacy skills (Johnson et al., 2010; Snow, 2012; Whitehouse, Line, et al., 2009). In addition to educational impacts, DLD has a high association with behavioural issues, social emotional concerns, difficulty with social relationships, lower levels of independence and poorer job prospects (Law et al., 2017; Lee, 2013; Whitehouse, Line, et al., 2009; Whitehouse, Watt, et al., 2009). Overall, the impacts of DLD are significant, affect many areas of life, and have both short and long-term consequences (Law et al., 2017; Lee, 2013; Snow, 2016).

The impacts of living with DLD cannot be overstated and are explored further in Chapter 2. Of note at this point, however, is the consideration of DLD in relation to the definition of disability underpinning the 1992 Disability Discrimination Act (DDA; Australian Government, 2016). The DDA definition of disability includes "a disorder or malfunction that results in the person learning differently from a person without the disorder or malfunction" (Australian Government, 2016, p. 5). As DLD is a disorder that results in the person learning differently from a person without DLD, it constitutes a disability under the DDA. This becomes relevant when examining DLD in the educational context, especially with regards to the obligation that education providers must provide reasonable adjustments (Graham & Tancredi, 2019).

Despite DLD being a common disability with significant functional impacts, it largely remains misunderstood (Law et al., 2017; Lee, 2013). This occurs for several reasons. Firstly, a multitude of terms have been used to refer to this type of language difficulty creating confusion even amongst professionals who work in the field of child development (Bishop, 2017; Bishop et al, 2017). Secondly, language difficulties are subtle and easily misunderstood, so it is often only the impacts of the language disorder that are seen (Law et al., 2017; Lee, 2013; Snow, 2012). Challenges with literacy, learning, behaviour, social interaction and social-emotional wellbeing are often noted and addressed by parents and professionals, without recognising the underlying language issue (Bishop et al., 2017; Law et al., 2017; Lee, 2013). This is often due to language competence being taken for granted and therefore rarely examined or considered as a contributing factor or underlying cause. Rather than being considered an invisible disorder, DLD may be more aptly described as "hiding in plain sight" (Tancredi, 2018, p. 2). Further contributing to the obscure nature of DLD is the fact that children with DLD do not all present with the same profile of language strengths and difficulties (Bishop et al., 2017; Paul, 2007). This makes accurate identification of DLD difficult for those not accustomed to examining the nuances of language competence (Antoniazzi et al., 2010; Law et al., 2017; Lee, 2013).

Language is a complex system involving the integration of many skills (Bloom & Lahey, 1978; Leonard, 2014; Paul, 2007). Presentation of DLD is then dependent on the component skill or skills that are impacted and this varies from child to child (Bishop et al., 2017; Leonard, 2014; Paul, 2007). The ambiguity of DLD is also perpetuated by confusion with terminology (Bishop & Leonard, 2014; Bishop et al., 2017; Reilly, Bishop, et al., 2014). DLD is only one amongst a host of

communication disorders and the terms used to discuss or describe these are often misunderstood and misapplied. The terms speech, language and communication all hold distinct meanings, yet are often used interchangeably by professionals and the public. The misunderstanding and misuse of the term language can have serious implications for understanding the characteristics, impacts and required supports of a child experiencing DLD.

As this project focuses on language, distinct from speech or communication, clarification of these terms is necessary. Language is essentially the process of conveying and understanding meaning. It is the systematic way that words are used to share thoughts and ideas (Bloom & Lahey, 1978). Language is a complex system with various integrated components including semantics, morphology, syntax and pragmatic skills (American Speech Language and Hearing Association, 2017; Bloom & Lahey, 1978). It can be operationalised through oral, written or signed modes, which all apply the agreed rules and conventions of word meanings, and how to put words together to share thoughts and ideas (American Speech Language and Hearing Association, 2017). Language is comprised of skills of morphology (grammar), syntax (sentence structure), semantics (vocabulary), word finding, discourse, pragmatics, verbal learning, memory, and phonology (sound system). DLD is an impairment in one or more of the components needed to understand or use the systematic code, impeding meaning transfer.

In contrast, speech is not about meaning but rather the motor act of producing speech sounds. It is the production, combination and co-ordination of vocal sounds such that recognisable words are spoken orally (American Speech Language and Hearing Association, 2017; Bishop et al., 2016). Speech involves the co-ordination of breath, voice, tongue, teeth and lips to produce and combine these speech sounds

(American Speech Language and Hearing Association, 2017). Speech gives language (the meaning and message) an oral mode. A Speech Sound Disorder, is therefore different to a language disorder, as it constitutes a difficulty in co-ordinating the breath, voice, tongue, teeth and lips in a way that produces recognisable speech sounds in the form of intelligible words (American Speech Language and Hearing Association, 1993). A Speech Sound Disorder does not affect the same components of the communication system as a Language Disorder, except for phonology (the sound system). In some respects, the separation of the skills that make up speech and language skills are arbitrary.

While speech and language hold very specific meanings, communication is a much broader term that relates to how humans connect with each other (Afasic, n.d.). The term refers to all forms of linguistic and non-linguistic methods of conveying and understanding messages in appropriate ways. It includes speech and language, as well as voice, hearing, social interaction, body language and facial expressions, among other elements (Afasic, n.d.). Therefore, a communication disorder is a difficulty with one or more elements necessary to communicate successfully (American Speech Language and Hearing Association, 1993). The term Speech, Language and Communication Needs (SLCN) has been adopted, originally in the UK and more recently in Australia, as a broad, all-encompassing term that captures all people with speech difficulties/disorders, language difficulties/disorders, and other communication difficulties/disorders requiring some support (Afasic, n.d.; Bercow, 2008; Royal College of Speech Language Therapists, n.d.; Speech Pathology Australia, 2016). An international project was conducted in recent years to find a common terminology for all professionals working with children with language difficulties. It must be acknowledged however, there remains ongoing

debate about the acceptance of the term DLD, especially from academics in the USA (Rice, 2020).

In summary, DLD is one of a range of potential speech, language or communication difficulties (Bishop et al., 2017). It is a persistent and pervasive language disorder with no obvious cause but one that affects many facets of everyday life (Bishop et al., 2017). The cost across the lifespan to a person with DLD is significant, having the potential to impact literacy development, academic outcomes, vocational opportunities, social relationships, independence and social-emotional well-being (Bishop et al., 2017; Law et al., 2017; Lee, 2013). Provision of support, however, is hindered by poor knowledge of DLD, often leading to a lack of recognition (Bishop et al., 2017; Law et al., 2017; Lee, 2013). As such it is imperative to raise awareness and understanding of the characteristics and impacts of DLD, so that children experiencing these language issues are no longer missed, misunderstood, and marginalised.

It is well known that educational success sets children up for future life success. As DLD emerges in childhood, has significant impacts on learning and children spend a large portion of their time at school, this raises important questions about the role of teachers, schools and inclusive practice in improving the educational experiences and trajectory for children with DLD. Greater teacher awareness and knowledge of DLD may be one way to positively influence both short and long-term outcomes for children experiencing DLD.

Developmental Language Disorder and Education

Education in Australia is informed by the philosophy of inclusive education (Australian Curriculum and Reporting Authority, 2016; Australian Government, 2016; Australian Government Department of Education and Training, 2015).

Inclusive education is the product of weaving a human rights agenda together with the social model of disability (Danforth & Jones, 2015; Meehan, 2016). Inclusive education is underpinned by the belief that all people, including people with disabilities are equal, valued and entitled to dignity, respect and the same basic rights (United Nations, 1949; United Nations Division for Social Policy and Development Disability, 2006). Inclusive education recognises and affirms the diversity of the human population and conceptualises disability as the impact of a combination of personal, social and environmental factors, not as an internal personal affliction (Danforth & Jones, 2015; Rix, 2015; Slee, 2013; United Nations Division for Social Policy and Development Disability, n.d.). In Australia, students' rights to communication, to attend their local school, to be educated on the same basis as their peers, to receive reasonable adjustments providing access to the curriculum, and to enjoy a discrimination free school experience are outlined in a number of key documents, including international human rights law and national anti-discrimination legislation (Australian Government, 2016; Australian Government Department of Education and Training, 2015; United Nations Committee on the Rights of Persons with Disabilities, 2016; United Nations Division for Social Policy and Development Disability, 2006; United Nations Educational & Ministery of Education and Science, 1994).

To meet their legal obligations, schools and teachers must understand the social model of disability and work beyond a student-specific, impairment focus. According to the social model, disability is the result of an interaction between personal, social and environmental factors which creates barriers to activities and participation for a person with a disability (Graham et al., 2020). For a student with DLD, the personal factors are their individual language profile and their strategies to

self-advocate and manage life with a language disorder. Social factors include attitudes towards and perceptions of language, and social expectations of effective communication. Environmental factors include the language demands of the situation or environment. In combination, these factors present barriers to access and participation; importantly however, social, and environmental factors can be adjusted to enable access and minimise barriers. This is the work of inclusive educational practice.

Through its evolution, inclusive education has come to take on different meanings for different groups (Graham & Slee, 2008). To bring clarity to what is meant by the term inclusive education, the United Nations Committee for the Rights of Persons with Disabilities issued General Comment No. 4, (2016) which defines inclusive education as:

> a process of systemic reform embodying changes and modification to content, teaching methods, approaches, structures, and strategies in education to overcome barriers with a vision serving to provide all students of the relevant age range with an equitable and participatory learning experience and environment that best corresponds to their requirements and preferences. (United Nations Committee on the Rights of Persons with Disabilities, 2016, p. 4)

This definition clearly illustrates that inclusion is not simply the physical presence of all students in “regular ”classes without the accompanying philosophical approach and systemic reform needed to address the issue of equity and participation (United Nations Committee on the Rights of Persons with Disabilities, 2016). It essentially encompasses systemic reform, systematic changes to structures and practice, and the intention to remake schools and schooling to provide equity and opportunity for all

(Davis et al., 2020; Graham & Sweller, 2011; United Nations Committee on the Rights of Persons with Disabilities, 2016).

Crucial to understanding inclusive education, is clarity about what it is not. Inclusive education is not exclusion, which is when "students are directly or indirectly prevented from or denied access to education in any form" (United Nations Committee on the Rights of Persons with Disabilities, 2016, p. 4). In developed nations, this was the case in generations past when people with disabilities were considered 'ineducable' and therefore not provided with any education (Christensen & Rizvi, 1996; Danforth & Jones, 2015). While overt exclusion of this kind may not be seen in developed nations today, more subtle forms of exclusion are still evident in schools (Slee, 2013). In the case of students with DLD, exclusion occurs when learning experiences and assessment tasks are delivered through language at a level of complexity that it presents a barrier to the curriculum.

Inclusive education is also not segregation. Segregation is when "the education of students with disabilities is provided in separate environments designed or used to respond to a particular or various impairments, in isolation from students without disabilities" (United Nations Committee on the Rights of Persons with Disabilities, 2016). Segregated education became an approach in the 1960s and emerged in the form of separate educational institutions for people with different disability types. At the time, this signalled progress for people with disabilities who were initially considered 'educable' through the provision of specialist instruction in special facilities (Christensen & Rizvi, 1996). While segregated education was popularised in the 1960s, this type of approach is not restricted to history. It remains part of present educational practice in Australia in the form of separate special schools, units, and classes. This dual system, of 'special' and 'mainstream', persists

despite the national and international move towards inclusion (Graham & Sweller, 2011; Slee, 2013). In the case of students with DLD, education provided by means of specialist classes, units, and schools for all or part of a school day or week constitutes segregation.

Most importantly, however, is the distinction between inclusive education and integration. Integration is defined as "a process of placing persons with disabilities in existing mainstream educational institutions, as long as the former can adjust to the standardised requirements of such institutions" (United Nations Committee on the Rights of Persons with Disabilities, 2016). Integration is the action of physically including students, though in the absence of the philosophical underpinnings of equity and human rights that are the basis of inclusion (Danforth & Jones, 2015). Asking all students to 'fit' the established system and practices of schooling is an attempt at normalising students with diverse presentations to some mythical average or norm (Graham, 2006). Integration, however, is likely a common experience for many students with disabilities, including those with DLD as there is yet to be systematic education reform in Australia, as is needed to transition to inclusion (Graham, 2015).

While systemic reform has not yet occurred in Australia (Anderson & Boyle, 2015; Graham, 2015; Graham & Sweller, 2011; Slee, 2013), there are numerous indicators of a national commitment to progressing inclusive education (Australian Government, 2015a, 2016; Australian Government Department of Education and Training, 2015; United Nations Division for Social Policy and Development Disability, 2006; United Nations Educational & Ministery of Education and Science, 1994). The 1992 Disability Discrimination Act (DDA), Disability Standards for Education 2005 (DSE) and the Australian Professional Standards for Teachers

illustrate the requirement for all teachers to acknowledge, value and effectively address student diversity (Australian Government, 2016; Australian Government Department of Education and Training, 2015; Australian Institute for Teaching and School Leadership, 2017a). The expectations placed on teacher knowledge and practice to meet students' entitlement to an inclusive education are high. Teachers are expected to implement reasonable adjustments to enable students with disability to enrol, access a course of study, and use the facilities or services on the same basis as peers without a disability (Australian Government Department of Education and Training, 2015). Adjustments that provide participation and access to the curriculum are crucial for students with DLD. The ability to make reasonable adjustments, however, is reliant upon quality teacher judgement (McLeod, 2011). In turn, quality teacher judgement is reliant upon a sophisticated body of professional knowledge (McLeod, 2011). The first of the seven Australian Professional Standards for Teachers highlights the importance of teacher knowledge by indicating that teachers must "know students and how they learn" (Australian Institute for Teaching and School Leadership, 2017b). Knowing students with DLD and how they learn is therefore crucial for teachers in examining, understanding, and acting to minimise the barriers that exist in classrooms. A depth of professional knowledge of DLD is necessary for all teachers, as prevalence data indicates that all teachers are likely be teachers of students experiencing a DLD every year of their teaching careers (Norbury et al., 2016). As such, teacher knowledge of DLD is the premise for this study.

Australian policies and standards, influenced by the human rights agenda and social approaches to disability, place teachers, schools, and inclusive practice in a prime position to be the catalyst for improved outcomes for students with DLD. The

role of teacher knowledge is fundamental to this potential positive impact (Athey, 2007; Shulman, 2005). If teachers are equipped with professional knowledge to understand students with DLD and how they learn, they are in a better position to make judgements about the learning environment and to then implement appropriate adjustments (McLeod, 2011). These teachers are likely to be in a better position to address and meet students' right to access, participate and achieve at school. Alternatively, if teachers do not have knowledge of the characteristics and impact of DLD on learning, they can only draw on limited and intuitive knowledge to make judgements and decisions about reasonable adjustments (Athey, 2007). Limited teacher knowledge, however, may result in unintended restriction and impingement of students' rights, access, and opportunities to participate and achieve at school, as is their entitlement. Highlighting, investigating, and understanding teacher knowledge of DLD is essential, otherwise students experiencing DLD may well remain unrecognised and unsupported in the school context.

To date there has been only one study, a thesis by Girolamo (2017), that has specifically considered teachers and DLD, or Specific Language Impairment (SLI) as it was termed in that study. Girolamo examined if teachers took part in identifying students with DLD, whether they would make a referral to a specialist and what treatment options they might implement in the classroom to support these students. With only this study by Girolamo, a gap remains in the literature regarding the knowledge teachers require to understand students with DLD and how they learn.

Other studies have investigated teacher knowledge, attitudes and beliefs with regard to students with speech, language and communication needs (SLCN) more generally (Dockrell & Howell, 2015; Dockrell et al., 2017; Dockrell & Lindsay, 2001; Marshall, Ralph, et al., 2002; Marshall, Stojanovik, et al., 2002; Mroz, 2006;

Mroz & Hall, 2003; Sadler, 2005). These studies have highlighted teacher concern with regard to their knowledge, training and barriers to effective and inclusive support for students with SLCN and will be detailed further in Chapter 2 (Dockrell & Howell, 2015; Dockrell et al., 2017; Marshall, Ralph, et al., 2002; Marshall, Stojanovik, et al., 2002; Mroz, 2006; Mroz & Hall, 2003; Sadler, 2005).

Across studies, the common barriers that teachers identified were time, resources, professional support and training, knowledge, and access to speech pathology services (Adger et al., 2003; Dockrell & Howell, 2015; Marshall, Ralph, et al., 2002; Marshall, Stojanovik, et al., 2002; Mroz & Hall, 2003; Sadler, 2005). Research in this sphere has primarily emerged from the UK, has taken a broad focus on students with SLCN and has utilised focused and narrow participant groups of teachers, typically those teaching in the Early Years or pre-service teachers. The studies have examined accurate identification of SLCN, knowledge of terminology, attitudes toward inclusion, teacher training related to SLCN, and the opportunities and barriers to effective support. These studies provide a glimpse into the possible need for enhanced teacher knowledge, competence and capacity to understand and respond effectively to students with SLCN, including those with DLD (Dockrell & Howell, 2015; Marshall, Ralph, et al., 2002; Sadler, 2005). As DLD is common and results in significant educational impacts, yet remains obscure and misunderstood, there is need for specific investigation into teacher knowledge of DLD. Not simply teacher knowledge of DLD but knowledge that informs choices about appropriate and reasonable adjustments. This is the primary intention of the current study.

Aims and Significance of Study

This M.Phil study focuses on teachers' knowledge of DLD, as well as their ability to interpret learner characteristics and identify appropriate adjustments. This

focus is essential given common misunderstandings of DLD, the potential for DLD to remain unrecognised and unsupported, and the significant and long term impacts it has for students if not addressed (Bishop et al., 2017; Law et al., 2017). The expectation is for teachers to use their professional knowledge to understand learners and how they learn (Australian Institute for Teaching and School Leadership, 2017a). This knowledge then informs the professional judgement required to design and implement reasonable adjustments that achieve effective inclusive practice. The current study investigates what teachers know about students with DLD and how they learn, and how this knowledge informs their selection of educational adjustments. Teachers' ability to do this encompasses a combination of knowledge domains about characteristics of DLD, associated educational impacts of DLD, and reasonable adjustments that target the language barriers. This focus is unique to this study yet crucial in understanding and supporting teachers in their endeavour to engage in proactive and inclusive practice for this group of students.

This study is also unique regarding the participant group. It gathered data from the full range of teachers, across a range of roles and phases of schooling, to gain a broad perspective of the current state of teacher knowledge related to DLD and inclusive practice. Mostly, previous studies have used narrow participant groups such as pre-service secondary teachers (Marshall, Stojanovik, et al., 2002) or early years teachers (Sadler, 2005). Understanding all teachers' perspectives is essential as DLD is a common and persistent disorder, emerging in childhood and continuing to be evident and to have an impact in adolescence and adulthood. All teachers will likely be a teacher of a student with DLD many years of their career. Additionally, students with DLD form a heterogeneous group, with each student having a unique profile of language skills, and with each students' profile of changing over time as

they mature (Leonard, 2014; Paul, 2007). Parallel to students' varied presentation is teachers' varied experiences and knowledge of language components, language development and language difficulty based on training, school setting and role, as not all levels of knowledge are equal or equivalent.

These aims form the basis of the following research questions:

1. What do teachers know about the (i) learner characteristics and (ii) educational impacts of Developmental Language Disorder (DLD)?
2. Are teachers able to (i) accurately interpret learner characteristics, and (ii) identify appropriate adjustments to enable access to the curriculum for students with DLD?
3. Are years of experience, training and speech pathology assistance associated with teacher knowledge of learner characteristics, educational impacts, and appropriate adjustments for students with DLD?

This study holds importance for every teacher and every student with DLD. Every teacher has the responsibility of providing an educational experience that meets a student's entitlement to an inclusive education. Investigating and understanding what teachers currently know about DLD is a means to determine what additional knowledge teachers need about students with DLD and how they learn. These data will provide evidence of the status of teachers' knowledge of DLD and related inclusive practice. Understanding what teachers know about DLD will assist in developing future professional learning and support. Identifying differences that exist between groups based on experience, training and access to speech pathology support may help to identify contextual factors that positively influence teacher knowledge of DLD and relevant adjustments.

Thesis Structure

The following chapters provide further detail regarding the issues of awareness and knowledge of Developmental Language Disorder (DLD) in the educational context. The literature review, contained in Chapter 2, summarises, and synthesises the body of literature relevant to DLD and school education. It further details the definition, history, characteristics, and impact of DLD before examining the emergence of inclusive education and subsequent obligations for teachers to provide reasonable adjustments. The key documents that shape inclusive education in Australia, including conventions, policies, and standards, are examined with respect to their relevance to students with DLD. Consideration is also given to the expectations that these conventions, policies and standards place on teacher practice. Finally, the literature relevant to teacher knowledge, attitudes, and beliefs about working with students with Speech, Language and Communication Needs (SLCN) is examined. Chapter 3 details the conceptual orientation of the proposed project. It provides a discussion of three key concepts that form the foundation of the research problem and design. These include inclusive education, the dilemma of difference, and the role of teacher knowledge. Chapter 4 outlines the research design and methodology, participants, procedure including ethical considerations; instrument design; pre-test and pilot. The chapter then goes on to outline recruitment, data-gathering, and analysis techniques. Chapter 5 presents the results, which are then discussed in Chapter 6, alongside suggestions to support teachers, limitations of the study and suggestions for future research.

Chapter 2: Literature Review

This chapter critically reviews and discusses the literature on three topics central to this study: (1) Developmental Language Disorder (DLD), (2) expectations for inclusive education, and (3) teacher knowledge of DLD. Section one discusses the definition and history of DLD, provides a model of language as a reference point for considering language competence and language disorder, and outlines the characteristics and impacts of DLD. Section two considers the emergence of inclusive education with specific reference to students with DLD. The third section of the chapter examines the corpus of research that has investigated teacher beliefs, attitudes, and knowledge of students with DLD, as a subset of students with speech, language, and communication needs (SLCN). The final section summarises key points from the literature and identifies the implications relevant to this proposed study. These key points form the basis of the conceptual orientation and methodology.

Developmental Language Disorder

Definition of Developmental Language Disorder. Developmental Language Disorder (DLD) is a diagnostic term used to refer to a profile of language difficulty that:

- "causes functional impairment in everyday life"
- "is associated with poor prognosis"
- is "not associated with a known biomedical aetiology"

  (Bishop et al., 2017, p. 1071)

DLD is distinguished from language difficulties, which are likely to resolve; language differences, which are the result of learning English as an additional

language; and Language Disorder, which also causes functional impairment and has a poor prognosis but has a known origin or cause (Bishop et al., 2017). Figure 2 presents a decision tree illustrating the differentiating points and pathway to diagnosis of DLD.

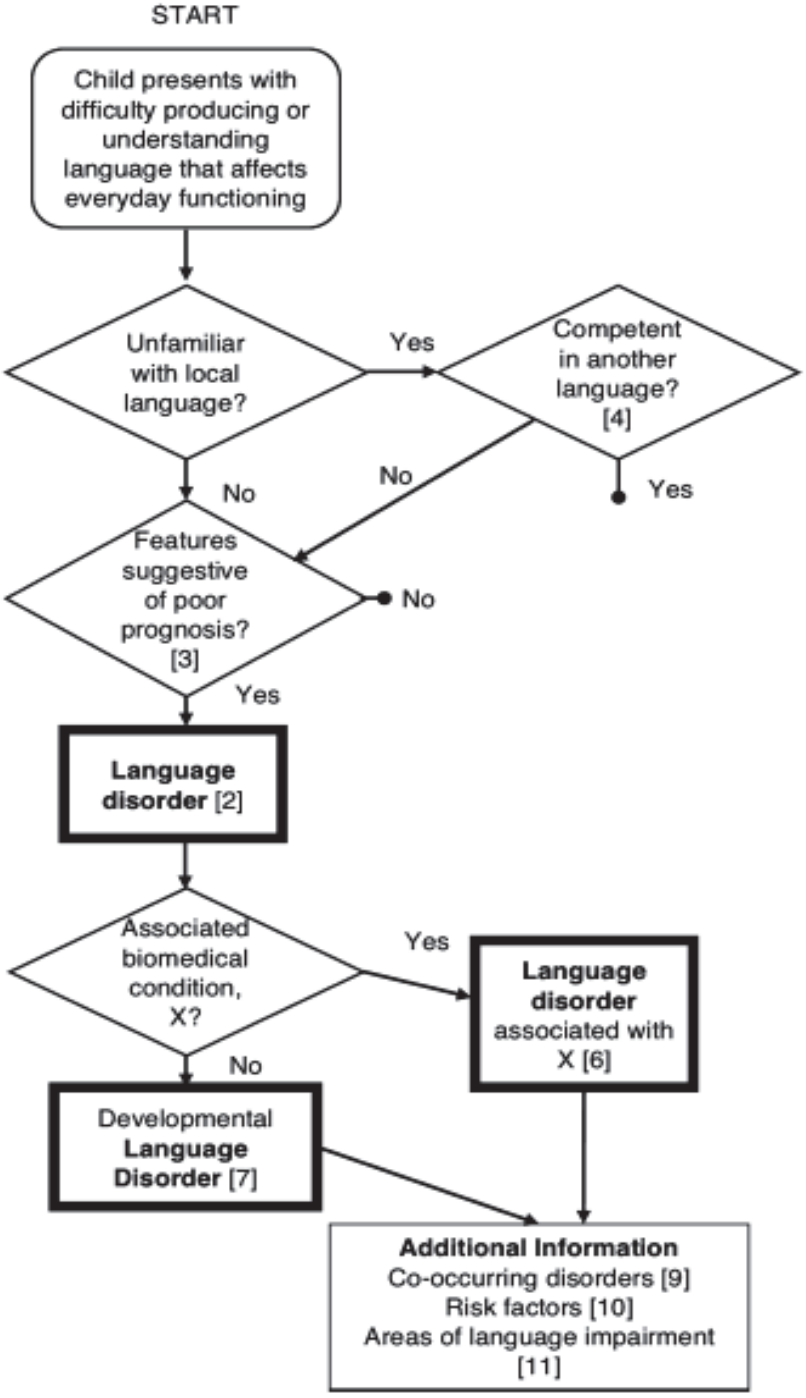
Critical to the understanding of DLD is that the term has been developed in acknowledgement of the multifaceted and complex nature of child development (Raising Awareness of Developmental Language Disorder, 2017). It is accepting of the reality that there is often no distinct boundary between conditions and that it is artificial and unhelpful to try to draw these boundaries (Bishop, 2017). Therefore, DLD can co-occur with other common conditions which have not been demonstrated to cause language disorder (Bishop et al., 2017). While a correlation may exist between risk factors, such as positive family history, and other disorders, such as ADHD, there is no demonstrated causal link (Bishop et al., 2017). Further, with DLD, there are no exclusionary criteria stipulated (Bishop et al., 2017). A child may have risk factors and co-existing issues however these do not preclude a diagnosis of DLD. This key element is also illustrated in Figure 2, points 9-11.

This 'openness' in application is in contrast to past iterations of diagnostic criteria which used cognitive referencing, requiring there be a mismatch between non-verbal IQ and language scores on a standardised assessment, and 'cut points' on standardised assessments, requiring a certain degree of severity to be measured (Bishop et al., 2017). This shift occurred because cognitive referencing has been demonstrated to have no bearing on understanding and supporting children with persistent language difficulties and scores on standardised assessment tools do not equate to functional impact (Bishop et al., 2017).

Figure 1

Decision Tree Illustrating Pathways to Diagnosis of Developmental Language Disorder

Reproduced from "Phase 2 of CATALISE: A multinational and multidisciplinary Delphi consensus study of problems with language development. Terminology," by D. V. Bishop, M. J. Snowling, P. A. Thompson & T. Greenhalgh, 2017, *Journal of Child Psychology and Psychiatry,* p 1075



The openness in diagnostic criteria of DLD is nuanced yet important, as understandings of DLD will inform the response of professionals across fields (Bishop, 2017). If there is a belief that a causal factor always needs to be identified, then it will be towards this causal factor that efforts for support will likely be directed. For example, teachers and parents may actively seek a diagnosis of Specific Learning Disability – Reading, or Intellectual Disability, and implement support based on these hypotheses for a child who has been identified with DLD, rather than acknowledging the impacts of DLD and working to address the language barriers impacting on reading or slow progress in learning. This more open approach to DLD acknowledges the reality of comorbidities in child development and maintains a focus on identifying persistent language difficulties with functional impact (Bishop, 2017). The recommendation is to acknowledge all co-occurring and impacting factors on a child's development and to address each (Bishop, 2017). A child with DLD may also have other developmental disorders or difficulties, for example Attention Deficit Hyperactivity Disorder (ADHD), in which case it is important to understand how the two diagnoses interact, acknowledge the functional impact of both and implementing strategies to address the functional impact of each disorder.

History of DLD. Developmental Language Disorder was endorsed as an internationally recognised diagnostic term in 2016, through two connected Delphi studies known as CATALISE. These studies sought consensus on terminology and identifying the characteristics of children who required additional support for their language development (Bishop et al., 2016, 2017; Ebbels, 2014). CATALISE stands for Criteria and Terminology that Applies to Language Impairment: Synthesising the Evidence. The use of the term *developmental* highlights the emergence of the

condition through development, rather than acquired through injury or being attributable to a known biomedical cause or origin (Bishop et al., 2017). The word *language* clarifies that the issue is specific to language rather than encompassing other components of communication such as speech, fluency, voice, or hearing. The word *disorder* illustrates the persistent and pervasive nature of the condition better than other descriptors like difficulty or delay (Bishop et al., 2017). The word disorder is also used across the two major classification systems for diagnoses used by medical professionals—the Diagnostic and Statistical Manual of Mental Disorders 5th Edition (DSM V) and the International Classification of Disorders, 11th Edition (ICD 11; Bishop et al., 2017). As such, it aligns with terminology describing other neurodevelopmental conditions, such as Attention Deficit Hyperactivity Disorder (ADHD; Bishop et al., 2017). It is this contemporary understanding of Developmental Language Disorder that informs the current study.

While the terminology of Developmental Language Disorder is new, this type of language issue is not (Paul, 2007). Since 1825, professional interest, engagement and research in language development and disorders has fallen at the intersection of medical, allied health, and education professionals, including neurologists, psychologists, speech pathologists and teachers (Bishop & Leonard, 2014; Norbury, Tomblin, & Bishop, 2008; Paul, 2007). A child may present to a medical or allied health professionals (e.g., paediatrician, psychologist or speech pathologist) to investigate and determine the nature of concerns regarding language development, while regular support is typically provided through families, teachers and speech pathologists (Bishop et al., 2017). Each professional group conceptualises and approaches language difficulties with different underpinning philosophies leading to

inconsistencies in terminology, definitions, processes for identification, and access to support services (Bishop et al., 2016; Norbury et al., 2008).

On the issue of terminology, Dorothy Bishop notes that approximately 33 distinct terms have been used to refer to a language disorder with no known cause (Royal College of Speech Language Therapists, 2017, Jan 26) and that these various terms have not been consistently applied using the same diagnostic criteria. Instead, various inclusionary/exclusionary criteria have also been applied, both in research and in practice. This 'many labels, varied criteria' situation has led to a serious situation, whereby a very common and serious childhood issue appears as elusive and fictitious as a fairy tale that Bishop describes as a 'Cinderella' topic (Royal College of Speech Language Therapists, 2017, Jan 26). Concerns raised by a group of professionals in the UK (Bishop & Leonard, 2014; Ebbels, 2014; Reilly, Bishop, et al., 2014; Reilly, Tomblin, et al., 2014), include:

- inconsistent identification and support of language disorders with no known cause,
- variable access to services for children and families,
- application of extremely stringent criteria exacerbating the issue of acknowledgement and access to services,
- disagreement and confusion within and between professional groups,
- a disconnect in the body of research investigating language disorders with no known cause, and
- limited public awareness and understanding.

The situation of confused terminology ultimately resulted in a language disorder with no known cause being often "missed, misinterpreted, misunderstood" with these children being variably identified and supported (Bishop et al., 2016; Lee,

2013). The issue of equity of access to support was one of the drivers for seeking clarity and consistency (Bishop et al., 2017). The clarity resulting from the CATALISE projects gives a common language, definition, approach, and framework to those working in the area of child language. What was once a 'Cinderella' topic has now been given substance and a firm foundation to progress work that is supportive of this group of children.

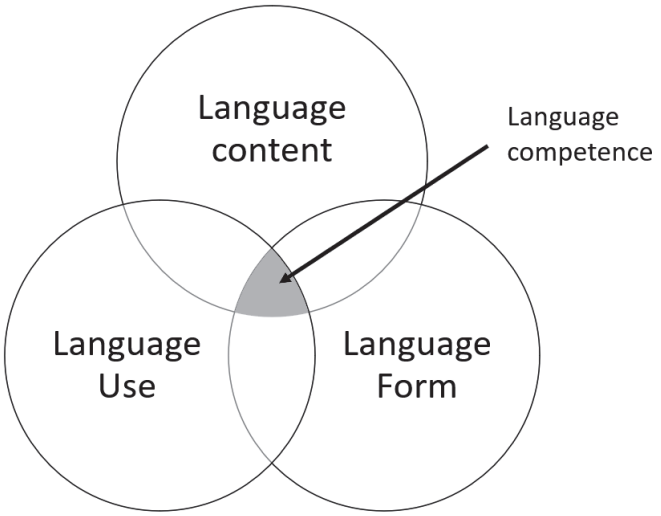
Models of Language. Language has been described as a complex, synergetic system comprised of interrelated components (American Speech Language and Hearing Association, 2017; Bloom & Lahey, 1978; Paul, 2007). Functional, competent language use consists of all of the critical components working in an integrated way (American Speech Language and Hearing Association, 2017; Bloom & Lahey, 1978). The model offered by Bloom and Leahy in Figure 2 has been used by psychologists and speech pathologists, alike as a way to understand and describe language (Paul & Norbury, 2012). This model of language comprises three overlapping domains or skills sets that function interdependently: language content, language form, and language use (Bloom & Lahey, 1978). This model of language is depicted in Figure 3, illustrating the integration required for language competence (indicated by the arrow).

Language content refers to the meaning system of language or semantics (American Speech Language and Hearing Association, 2017; Bloom & Lahey, 1978; Paul, 2007). It encompasses the knowledge and meanings we hold about an object, action, feeling or experience and attaches this knowledge to a sign, such as a spoken, written or signed word (Merriam-Webster dictionary online, n.d). Language content involves both understanding words and word meanings, as well as being able to use accurate and specific words to convey meaning. Language content is more than

simply having a large vocabulary or knowing words, but involves flexible, broad and sophisticated understandings of word meanings, along with knowledge of the rich web of interconnections that exist between words (Reilly & Love, 2006).

Figure 2

Model of Language as Described by Bloom and Lahey (1978)



Language form describes the agreed structure of how language components can be put together (Bloom & Lahey, 1978; Paul, 2007). Language form is constituted by several subsystems. Starting from the smallest unit, language form includes:

- *phonology* – the rules that govern how phonemes, or sounds, can be combined;
- *morphology* – the rules that govern how morphemes, or the smallest units of meaning (such as 'dog' to indicate the animal, or 's' to indicate plurality) are put together; and
- *syntax* – the rules that govern how words can be put together to create meaningful sentences (American Speech Language and Hearing Association, 2017; Bloom & Lahey, 1978).

These rules are systematically applied and allow people to combine the language content units, signs or words, in a way that can be understood by all common language users (Leonard, 2014).

Language use describes the purpose of communication and the influence of context (Bloom & Lahey, 1978; Paul, 2007). Other terms used to describe this domain or set of skills is social interaction or pragmatics (American Speech Language and Hearing Association, 2017; Dewart & Summers, n.d.; Paul, 2007). There are two main aspects within language use: *function* – the purpose for which language is being used; and *context* – the influence of the surrounding circumstances (Bloom & Lahey, 1978). Language use therefore encompasses conventions about appropriate ways to use language for the intended purpose given consideration of the immediate context (American Speech Language and Hearing Association, 2017; Bloom & Lahey, 1978). Competence in this domain involves an acute awareness of the communicative landscape and flexibility in the selection and use of words, sentences, and means of communicating to fit the context and purpose (Bloom & Lahey, 1978; Leonard, 2014; Paul, 2007). Language use therefore influences the other domains of language content and language form. This awareness extends to linguistic components, such as words and meanings and phrasing and sentences, but also to non-linguistic components such as tone of voice, facial expression, role and relationship of communicators and situational factors, amongst other elements (Bloom & Lahey, 1978). Language use is primarily about how and why people engage with other people.

Ultimately, language competence is the successful integration of all three sets of skills (Bloom & Lahey, 1978). Knowledge of the integration of each of these components constitutes language knowledge and language knowledge can be

translated to language competence (Bloom & Lahey, 1978). People utilise this competence in both understanding and conveying messages (Bloom & Lahey, 1978). Language therefore comprises both a receptive domain and an expressive domain (American Speech Language and Hearing Association, 2017; Bloom & Lahey, 1978; Paul, 2007).

Language is a sophisticated and complex system, requiring the coordination and integration of a host of subskills (American Speech Language and Hearing Association, 2017; Bloom & Lahey, 1978; Paul, 2007). Poor knowledge or functioning of any of these subskills, across the three main components of language – content, form and use – interrupts the integrated workings of the system and leads to difficulties with language competence (Bloom & Lahey, 1978; Leonard, 2014). Language difficulties can present in many different ways depending on which subskill, or combination of subskills, is impacted (Leonard, 2014). As such, understanding a language disorder involves understanding the complexities and components of the language system and the type of difficulty that may present as the result of an interruption or combination of interruptions to that system.

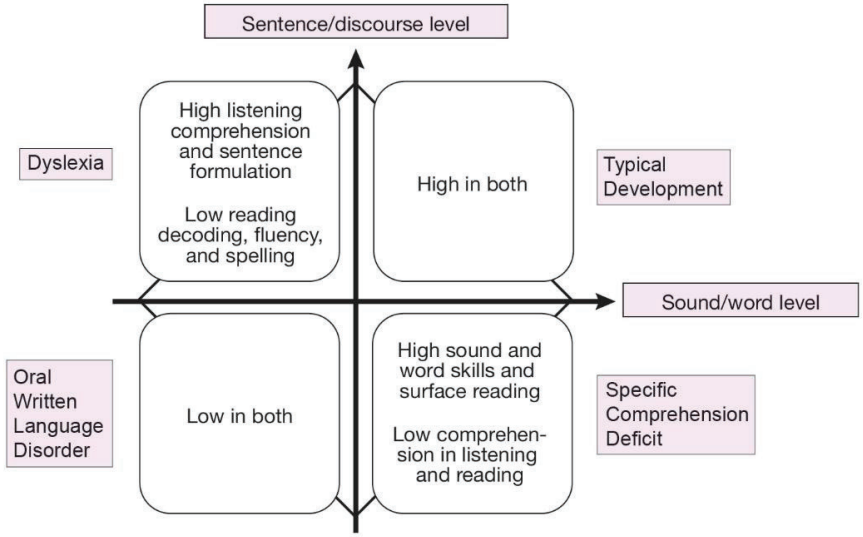
The Bloom and Lahey (1978) model of language remains prominent in the field of speech pathology as a theoretical and clinical reference point. It is still used as a framework for understanding and describing language profiles according to the key skill sets - content, form and use, across two key domains - receptive and expressive (Bloom & Lahey, 1978). However, other models for understanding and describing language and language-based disorders have emerged in recent years (Adlof & Hogan, 2018). These new models have evolved through research to explore links between spoken language disorders, such as DLD, and written language disorders, such as Dyslexia. A number of authors (Adlof & Hogan, 2018; Bishop &

Snowling, 2004; Catts et al., 2005; Nelson et al., 2016) have utilised quadrant models to describe patterns of language strengths and weaknesses across both spoken and written modalities.

Quadrant models work by having two axes that intersect perpendicularly, creating four quadrants. Each axis represents a different skill set, in this case language skills, while each quadrant represents a particular pattern of language skills. By plotting performance in each skill set along the relevant axis and mapping an intersection point, a language profile or descriptor can be generated. The quadrant model by Nelson et al. (2016) is the most relevant to this study and the school context (Figure 3). It plots sound/word level skills against sentence/discourse level skills and was developed as the conceptual framework for a new language assessment tool that the authors developed, the Test of Integrated Language and Literacy Skills (Nelson et al., 2016). The Nelson et al. model expands on previous quadrant models that mapped phonological (sound level) skills against other non-phonological language skills (Bishop & Snowling, 2004; Catts et al., 2005) and offers a model that is authentic to real world language skills, considers both oral and written language, and helps to build meaningful profiles of student's skills.

Figure 3

Model of Language as Described by Nelson et al. (2015)



In the Nelson et al. model, the sound/word level (horizontal axis, Figure 3), encompasses skills of phonology (sound level skills), morphonology (word level grammar such as past tense, plurals and affixes) and phonics (knowledge of sound-letter correspondences). Both phonology and morphology are integral parts of the language system and are crucial to overall language competence. As a set of three skills together, however they are critical for the development of literacy, specifically the ability to decode (Catts et al., 2005). In the Bloom and Lahey (1978) model, phonology and morphology were part of the *language form* component, and phonics was not included.

In contrast, the sentence/discourse skills (vertical axis, Figure 3) of the Nelson et al. model include vocabulary knowledge, sentence comprehension and formulation, discourse or text level comprehension and formulation, as well as social interaction skills. These skill sets generally align with Bloom and Lahey (1978). Vocabulary is similar to *language content*, sentence and text level skills are linked to *language form* while social interaction may be seen to align with *language use*.

These sentence/discourse skills are necessary to comprehend and use language effectively, both in spoken and written modalities. Similar to the Bloom and Leahy model, this quadrant model conceptualises language competence as the outcome of both having and being able to apply knowledge across all skill sets in an integrated way.

Using this model to plot skills across these two levels of language (sound/word and sentence/discourse), Nelson et al. (2016) hypothesise that not only can language competence be determined but also general profiles of different types of language-based difficulties or disorders. The top right quadrant represents typically developing language where sound/word and sentence/discourse skills are intact or developing as expected. In contrast, the bottom left quadrant represents difficulties with both sets of skills which would present as co-morbid spoken and written language disorders (Catts et al., 2005). The top left quadrant represents challenges with sound/word level skills which are identified markers for specific learning disorders in reading/writing or what is also termed Dyslexia or Dysgraphia, though varied definitions and criteria also exist for these disorders similar to the situation of language disorders in the recent past (Adlof & Hogan, 2018). Finally, difficulty with sentence/discourse skills (or the majority of skills described by Bloom and Leahy) is represented in the bottom left quadrant. While this quadrant is described by Nelson et al. (2016) as a specific comprehension deficit, the pattern of skills impacted would also describe any Language Disorder, including Developmental Language Disorder (DLD). It must be noted that the CATALISE studies determining agreement on diagnostic criteria and terminology (Bishop et al., 2016, 2017) had not been published at the time this model was developed.

While this model appears to be fixed and categorical in nature, it can actually be used to map each skill set incrementally and to pinpoint areas of strength and weakness. For example, although a student might fall in the 'typically developing' quadrant, they may have high average sound/word skills while their sentence/discourse skills are low average. This profile suggests the student may be able to decode well but that their broader language skills would not support comprehension at the same level of complexity. The model offers great potential and applicability to describe individual language profiles and likely functional impact in the school setting.

Characteristics of DLD. The characteristics and impacts of language disorders with no obvious cause (referred to in this section as DLD) have been the focus of research for many years (Leonard, 2014; Paul, 2007). While differing definitions and criteria have been applied in studies, complicating the ability to easily follow the body of research, key features have been identified and discussed in the literature. This section discusses the fact that DLD is common and persistent, making it crucial that all teachers are aware it exists. The section goes on to outline that DLD also captures students with heterogeneous language profiles which are often masked or hidden in some way, making it difficult for teachers to identify. That said, teacher knowledge of some key characteristics, or 'flags' of DLD can assist them in identifying student with DLD in their classrooms.

Common. DLD is often described as common however accurate estimates of prevalence are elusive due to the varied criteria applied in studies across time (Bishop & Leonard, 2014; Norbury et al., 2016). The most recent Australian research on the prevalence of language difficulties amongst seven-year-olds, suggests that 19% have low language abilities for their age (McKean et al., 2017).

The McKean et al. study was conducted at a similar time as the CATALISE studies and so did not incorporate the resulting DLD terminology and criteria. The study identified 'low language ability' as a language profile falling 1.25 standard deviations below the mean on standardised assessment, regardless of cause or prognosis (McKean et al., 2017). This criteria for 'low language ability' captured both children with a Language Disorder associated with another condition and children with DLD.

In contrast, a UK based population study of four to five-year-olds in their first year of school, estimated the prevalence of language disorders with unknown cause to be approximately 7% (Norbury et al., 2016). Again, this study was published prior to the CATALISE studies and so did not strictly apply the profile of language skills characteristic of DLD. Language disorder with no known cause was based on scores on standardised assessment being 1.5 standard deviations below the mean, as per the criteria for Language Disorder in the DSM 5, and included all students despite non-verbal cognitive scores (Norbury et al., 2016). This profile of language skills is the closest to that now agreed to constitute DLD and is therefore the most applicable estimate of its prevalence. The estimated prevalence of approximately seven percent equates to approximately two students in every average class of 30 (Norbury et al., 2016). This figure suggests that every teacher is a teacher of a student with DLD every year. Therefore, every teacher needs to be equipped with the knowledge and skills to effectively teach these students.

Persistent. One key feature of DLD is that it is persistent in nature (Bishop et al., 2017). Transient or short-term language difficulties are not captured by the descriptor or diagnosis of DLD (Bishop et al., 2017). Indicators of poor prognosis are variable dependent on a child's age (Bishop et al., 2017). Between the ages of

two and four, a child's language skills may move in or out of the range of typical development (Bishop et al., 2017; McLeod, 2011). However, research has demonstrated that language skills stabilise around five years of age and that students who commence schooling with a language disorder are likely to continue to experience ongoing language difficulties (Bishop et al., 2017; McLeod, 2011).

While all children have the potential to learn and improve their language skills, there is little evidence that those with DLD close the gap with their language typical peers (Bishop et al., 2017; McKean et al., 2017; Norbury et al., 2016; Tomblin et al., 2003). As DLD is a disorder of language learning, these students are still able to improve their language skills overtime, but not at the same rate as language typical peers and not to the same level of sophistication (Rice & Hoffman, 2015). The reality for schools is that relying on an attempt to fix, cure or remediate this type of language difficulty is not likely to be successful and is not the solution to equitable educational provision (Norbury et al., 2016). Given the persistent and ongoing nature of these students' language difficulties, the answer may in fact lie in each teachers' understanding of the characteristics of DLD, the functional impacts that it has on learning and school life, and the ways of working that are inclusive and which provide access to learning opportunities through appropriate adjustments.

Misunderstood. Despite DLD being common and persistent, it is often a disorder that is missed or misunderstood (Bishop et al., 2017; Law et al., 2017; Lee, 2013; Royal College of Speech Language Therapists, 2017, Jan 26). At times students with DLD go under the radar, with no one identifying any specific concerns for their development and learning. Often these are considered simply the low group of learners in a class. At other times students with DLD are described as "hiding in plain sight" in classrooms (Tancredi, 2018, p. 2), with teachers recognise a learning

issue but not the underlying language disorder. DLD can masquerade as other developmental concerns such as low cognitive functioning, general learning difficulties, literacy difficulties, behaviour issues, social-emotional concerns or simply poor motivation (Bishop et al., 2016; Law et al., 2017; Lee, 2013). Teachers frequently note these concerns and functional impacts of DLD but may not be aware of DLD or not able to see the pattern of language needs underpinning these other concerns (Antoniazzi et al., 2010; Law et al., 2017; Snow & Powell, 2012). Another confounding factor is that DLD often co-occurs with other developmental disorders. Prevalence data indicates that anywhere between 35-50% of children with ADHD also present with DLD (Redmond, 2004). Eadie et al. (2015) found a similar proportion of children with Speech Sound Disorder (SSD) with a co-occurring DLD. The Australian study found that 40.8% of 4-year-olds with SSD also presented with DLD. This figure would likely decrease with children's age however as their SSDs resolved.

While there is a high rate of comorbidity between DLD, ADHD and SSD, and aspects of these disorders may be expressed in similar ways, each has at least one distinct characteristic. Students with ADHD, for example, are known for hyperactive and impulsive behaviour which manifests in talking out of turn and moving about the classroom when expected to be in their seat. And although, students with ADHD often miss instructions, this is not generally due to difficulties with language comprehension, as for students with DLD, rather due to inattention and working memory limitations. Similarly, students with SSD may be difficult to understand but this is a result of speech production rather than meaning as in the case of students with DLD. These distinctions need to be well understood by teachers because they directly affect how teachers interpret students' presenting characteristics, whether

teachers correctly identify barriers to learning, so that they can implement relevant and effective adjustments.

As DLD can easily go undetected, a starting point for teachers is developing an awareness of common language characteristics associated with DLD and likely impacts. Knowledge of these red flags can address the misunderstandings associated with DLD and give teachers the means to proactively consider their students' presentation with these red flags in mind and investigate further as needed. Common language characteristics of a student with DLD include those illustrated in Table 1. Awareness of these characteristics may be the prompt needed for teachers to consider DLD as a possible component of a student's profile as a learner (Law et al., 2017; Lee, 2013).

Table 1

Common language characteristics of DLD

Connection to Language Models		**Common Characteristics**
Sound/word Level. (Nelson et al.)	Not included (Bloom & Leahy)	• Difficulty with rhyming activities • Difficulty counting syllables and sounds in words • Poor phonemic (sound) awareness • Challenges in learning letter-sound relationships • Difficulty with reading – decoding the text • Difficulty with accurate spelling

Connection to Language Models		Common Characteristics
Sentence/Discourse Level (Nelson et al.)	Language Content (Bloom and Leahy)	• Limited or misunderstanding of common words (e.g., before, co-operate, jaw) • Limited/basic vocabulary when speaking (e.g., big rather than huge, enormous • Inaccurate use of words (e.g., lake when referring to river) • Overuse of generic/non-specific words (e.g., stuff, over there) • Single meaning only (e.g., bare/bear = animal but not naked or empty or reveal or plain) • Limited connections between vocabulary items (e.g., connect vocabulary it relies on knowledge of multiple meanings)
Sentence/Discourse Level (Nelson et al.)	Language Form (Bloom & Leahy)	• Misunderstand grammatical elements (e.g., not, pronouns) • Poor or incorrect use of grammar (e.g., past tense, plurals) • Primarily use incomplete or simple sentences • Confused or mixed-up word order in sentences • Stop, start and rephrase sentences when speaking • Difficulty retelling personal events or explaining (e.g., lack detail & cohesion)
	Language Use (Bloom & Leahy)	• Misunderstand/not able to keep up with conversations • Answer questions tangentially • Difficulty adjusting language for situations (e.g., not able to use more formal/academic language when needed) • Misunderstand social cues (e.g., turn taking in conversations, understanding a listener's perspective) • Misunderstand facial expressions, tone or voice, body language

Note: Comparison to typical development with these skills is necessary

Heterogeneous. Given the multifaceted nature of language, DLD may manifest in a multitude of ways depending on which component skills are impacted and their flow on effect (Leonard, 2014). This makes for a heterogeneous group of children, each with a unique profile of language skills and functional presentation (Bishop et al., 2017). Children's language systems and skills also mature and develop over time. As a result, the presentation of the language disorder will change over time too (The Communication Trust, n.d.-a). That said, students with DLD will have difficulties with at least one component of the language system (content, form and/or use) and familiarity with common language characteristics is helpful for identification of students with DLD. The varied, individual, and dynamic presentation of DLD signifies a challenge for teachers when planning and implementing an appropriately targeted teaching response. Knowledge of the language system, DLD, and each student's individual profile of language skills, is supportive to this process. Partnership between teachers and speech pathologists will also further support the design and planning of most helpful adjustments.

Bishop and colleagues (Bishop & Leonard, 2014; Bishop et al., 2016; Reilly, Bishop, et al., 2014; Reilly, Tomblin, et al., 2014; Snow & Powell, 2012) proposed that confusion in terminology and diagnostic criteria have been detrimental to building strong public awareness of DLD. DLD also has no physical outward indicator that immediately signals the disorder, unlike some other disorders or disabilities that are more recognisable (Lee, 2013). Misunderstanding of DLD is further compounded by its heterogeneous nature. While all students with DLD have difficulties with oral language, a general lack of awareness of the disorder and individualised language profiles can make students with DLD difficult for teachers to accurately identify in the classroom context (Antoniazzi et al., 2010). Teacher

knowledge however can be crucial in overcoming this challenge. A baseline awareness of DLD is a crucial first step.

An awareness that DLD exists and is common means that teachers can be alert to it. Building both a general awareness of DLD and knowledge of some common characteristics will assist in active identification of students with suspected language difficulties. An understanding that the pattern of learning challenges for these students will be related to language-loaded tasks and that their understanding and use of spoken language will differ from peers. Once identified a teaching response acknowledging of language difficulties can be implemented while further investigation occurs, with specialist support of a learning support teacher or speech pathologist. With deeper knowledge of the student's language profile this initial teaching response can be refined.

Impact of DLD. Knowledge of the common functional impacts of DLD, such as social interaction challenges, behaviour concerns, difficulty learning literacy, may prompt teachers to look deeper into students' language abilities rather than addressing the first presenting issue. Given that language is essential to daily socialisation and learning activities, difficulties with language can have profound impacts in childhood that compound through adolescence into adulthood (Lee, 2013). Low language competence has impacts on behavioural and social development, relationships, social-emotional wellbeing, educational engagement and attainment, independence and employment (Law et al., 2017; Lee, 2013). The impacts are significant, widespread, and both immediate and long lasting (Bishop et al., 2016, 2017; Law et al., 2017; Lee, 2013). While the language disorder itself is often not seen, these impacts are very visible (The Communication Trust, n.d.-b)

Behavioural impacts. Language competence has an impact on children's behaviour and social emotional well-being (Law et al., 2017; Lee, 2013). From an early age, language is how children learn to mediate and self-regulate their behaviour (Lee, 2013). Research has shown that there is a high association between language difficulties and behavioural difficulties, with some children demonstrating externalising behaviours, such as verbal and physical outbursts, and others exhibiting internalising behaviours, like social withdrawal or anxiety, when experiencing difficulties due to language issues (Cohen et al., 1998; Law et al., 2017; Lee, 2013). Behavioural difficulties, especially those expressed externally, are often more evident to the observer and can mask the underlying language concern (Cohen et al., 1998; Law et al., 2017).

Adolescent and adult mental health concerns can be the result of unrecognised and untreated DLD (Conti-Ramsden et al., 2013; Law et al., 2017; Schoon et al., 2010; Whitehouse, Line, et al., 2009). Conti-Ramsden et al. (2013) found that 16-year-olds with a history of language disorder self-reported more behavioural difficulties than peers, with students experiencing receptive language issues being more likely to report conduct or antisocial behaviours. These students also demonstrated an awareness of their mental health status and reported a greater level of emotional symptoms than their peers. When investigating longer term impacts in young adults with a history of language disorder, a significantly higher rate of psychiatric disorders was noted compared to control groups (Beitchman et al., 2001; Whitehouse, Line, et al., 2009). Beitchman et al. (2001) found the rate of psychiatric conditions to be at 40% in the language impaired group compared to 20% in the control group.

Social impacts. Language competence also impacts a child's social development and social interaction (Law et al., 2017; Lee, 2013; Snow, 2012). Talk forms a key component in everyday interactions including play and building relationships when young (Lee, 2013; Snow, 2012). Children with DLD find making and keeping friends a challenge (Fujiki et al., 2002). As children develop, more sophisticated language is needed to navigate the complex social interactions of teen years and adulthood (Snow & Powell, 2011; Snow & Powell, 2008).

Adolescents with DLD have been found to be 12 times more likely to have difficulties with peer relationships, despite simultaneous self-reports of prosocial behaviour (Conti-Ramsden & Durkin, 2008). This suggests teens with DLD may have poor awareness of their capacities in the area of social interaction (Conti-Ramsden & Durkin, 2008). Approximately 20% have ongoing difficulty with friendships and intimate relationships (Whitehouse, Line, et al., 2009). Lower language competence has the potential to lead to limited abilities to build and maintain friendships and poorer capacity to negotiate, problem solve, and resolve conflict with others. These difficulties, along with a limited awareness of the impact of their own behaviour, can lead to anti-social behaviour and eventual trouble with the law (Lee, 2013; Snow & Powell, 2011; Snow & Powell, 2008). Research has shown that approximately 50% of young offenders have DLD, often not previously identified (Snow & Powell, 2011). This however illustrates a worst-case scenario. For many children with DLD, recognition and response to their language needs can alter their life course.

Educational impacts. Historically, the academic achievement of students with any type of communication disorder has lagged behind their typically developing peers, though a gentle trend toward improvement has been noted with more of these

students completing secondary education and achieving some base level qualifications (Conti-Ramsden et al., 2009; Dockrell et al., 2007; Durkin et al., 2015). Recent data suggest that 44% of students with DLD obtained 'passing' scores in their final year of secondary compared to 88% of language typical students (Conti-Ramsden & Durkin, 2008). The academic attainment lag however is not only evident in high school. Durkin et al. (2015) also found that a group of 11-year-old students with DLD performed more poorly than peers as measured through national testing in the areas of English, Maths and Science. What was noted in this study, however, was that some students with DLD did match the attainment of non-language disordered peers and that the impact of DLD appeared to variably impact each subject area (Durkin et al., 2015). This comparatively poor performance is likely due to the fast-paced, language-loaded nature of the classroom environment (Norbury et al., 2008).

Academic attainment is impacted so significantly by DLD as "almost every educational skill presupposes the use of language" (Dockrell & Lindsay, 1998, p. 117). In addition, it is often assumed that children start school with many of the necessary building blocks to develop foundational literacy and numeracy skills such as phonological (sound) awareness, basic vocabulary and understanding of positional and sequence concepts. This is simply not the case for students with DLD (Norbury et al., 2008). Language and literacy skills are strong predictors of academic success (Conti-Ramsden & Durkin, 2008). Beyond these challenges, Snow (2014) raises the need for all students to continue to develop a set of ever more sophisticated language skills, known as academic language. This academic language is essential to engage in scholarly tasks and to succeed at school (Snow, 2014).

Long term impacts. The associated impacts of DLD on behaviour, social emotional well-being, social interaction, relationships, and education have been found to have significant adverse outcomes long term. In facing these challenges, children with DLD may grow into adults with lower levels of independence and limited employment opportunities (Conti-Ramsden & Durkin, 2008; Johnson et al., 2010; Whitehouse, Line, et al., 2009; Whitehouse, Watt, et al., 2009). While many grow to be independent, they are likely to be less independent than age matched peers as both adolescents and adults (Conti-Ramsden & Durkin, 2008; Johnson et al., 2010). Conti-Ramsden and Durkin (2008) specifically found levels of independence for adolescents to be linked to both language competence and reading comprehension. Adults with a history of DLD were typically found to pursue vocational training, gaining employment in positions of lower pay than peers, typically in the trade or service industries (Whitehouse, Line, et al., 2009).

The long term and wide-ranging impacts for individuals with DLD outlined above, compound to create a societal burden. According to Ruben (2000) "[c]ommunication disorders will be a major public health concern for the 21st century because, untreated, they adversely affect the economic well-being of a communication-age society" (p. 245). More recently, Cronin (2017) examined the economic impact of DLD in Australia and found the national cost per year to be between $1.362 billion and $3.308 billion per year (based on a prevalence range of seven to 17 per cent). This cost is through lost productivity of mothers of children with DLD as well as the children themselves along with costs to health, education, and social support systems. The impact of DLD cannot be viewed as a discrete issue with language, but one that has wide ranging and significant impacts for students at

school and their life trajectory beyond. Some of the compounding impact of DLD are illustrated in Table 2.

Table 2

Example Links Between Characteristics, Functional Impacts and Compounding Impacts of DLD

Language Models		Oral Language Characteristics of DLD	Functional Impacts of DLD	Possible Compounding Impacts
Sound/word level (Nelson et al)	Not applicable (Bloom & Leahy)	• Difficulty with rhyming activities • Difficulty counting syllables and sounds in words • Poor phonemic (sound) awareness	• Challenges in learning letter-sound relationships • Difficulty learning the alphabetic code	Poor reading decoding & spelling ⇣
Sentence/Discourse Level (Nelson et al.)	Language Content (Bloom & Leahy)	• Limited or misunderstanding of common words • Single meaning only • Limited connections between vocabulary items • Limited/basic vocabulary when speaking • Inaccurate use of words • Overuse of generic/non-specific words	• Difficulty following directions • Difficulty learning new vocabulary • Difficulty learning and understanding new concepts • Difficulty connecting new words to known words → new concepts to known concepts • Difficulty conveying meaning accurately when speaking & writing	Limit reading comprehension ⇣ Reduced learning of new concepts/content (through spoken and written modes) ⇣ Not develop sophisticated/academic vocabulary

Language Models		Oral Language Characteristics of DLD	Functional Impacts of DLD	Possible Compounding Impacts
Sentence/Discourse Level (Nelson et al.)	Language Form (Bloom & Leahy)	• Misunderstand grammatical elements • Misunderstand sentences (especially complex sentences) • Poor or incorrect use of grammar • Mainly use incomplete or simple sentences • Confused or mixed-up word order in sentences • Stop, start and rephrase sentences when speaking • Difficulty retelling personal events or explaining	• Difficulty understanding spoken information - instructions, narratives, explanations, conversations. • Miss or misunderstand key and nuanced information • Difficulty sharing ideas, thoughts, explanations, justifications effectively	Difficulty understanding information shared by teachers/peers (spoken or written – instructions, explanations, websites, emails, textbooks) ↓ Difficulty developing age-appropriate writing skills ↓

Language Models		Oral Language Characteristics of DLD	Functional Impacts of DLD	Possible Compounding Impacts
Sentence/Discourse Level (Nelson et al.)	Language Use (Bloom & Leahy)	• Misunderstand/not able to keep up with conversations • Answer questions tangentially • Difficulty adjusting language for situations • Misunderstand social cues • Misunderstand facial expressions, tone or voice, body language	• Difficulty engaging in language-based activities (conversation, play, banter/jokes, sharing thoughts, ideas, explanations, learning, reading/writing) • Difficulty engaging in social interactions	Poor learning progress ⇣ Difficulty demonstrating new learning (spoken or written) ⇣ Difficulty negotiating and managing peer relationships
Sentence/Discourse Level (Nelson et al.)	Co-ordinated use of Content, Form, Use (Bloom & Leahy)	• Difficulty sequencing ideas/information • Challenged by cause-effect relationships • Difficulty with language-based problem solving • Unable to use language clues to help predict and make inferences • Misunderstands nonliteral language	• Difficulty moving fluidly from one topic/context to another • Difficulty demonstrating learning without adjustments (E.g., analyse, compare, contrast, discuss, evaluate, infer, predict, propose reflect, solve etc) • Not understand jokes, puns, idioms etc.	

Language Models	Oral Language Characteristics of DLD	Functional Impacts of DLD	Possible Compounding Impacts
			

Inclusive Education and Developmental Language Disorder

Language is a protective and predictive factor of later successes including the mastery of literacy, academic achievement, positive relationships, and social and emotional well-being, potentially affecting long-term life outcomes (Law et al., 2017; Lee, 2013). What occurs for a child with DLD at school has the potential to either minimise or emphasise its impact, positively or negatively affecting their life trajectory. For this reason, teacher awareness and understanding of DLD is critical, as is their knowledge of and ability to implement inclusive practices. Inclusive practice however should not be a matter of school lottery or individual teacher good-will. It is in fact a matter of human rights and entitlements (Australian Government Department of Education and Training, 2015; Graham & Sweller, 2011; United Nations Committee on the Rights of Persons with Disabilities, 2016).

The current educational context, both internationally and in Australia, is shaped by human rights obligations, the social model of disability, and the emergence of inclusive education, outlined in Table 3 (Meehan, 2016). Each is a significant development in its own right, yet all share a common history. The combined effect of rights, inclusion and social approaches to disability is encouraging the gradual reshaping of public consciousness, patterns of thought and ways of operating with reference to human diversity (Danforth & Jones, 2015; Rix, 2015). National and international declarations, conventions, policies, and standards document the expectation of Australian schools and teachers to acknowledge students' rights, to value and respect diversity, and to work towards equity and inclusion.

Table 3

Key Documents Shaping Australia's Education Landscape

Document	Year	Applicable context
United Nations Declaration of Human Rights (UNDHR)	1949	International
United Nations Convention on the Rights of the Child (UNCRC)	1990	International
Disability Discrimination Act (DDA)	1992	Australian
Salamanca Statement of Principles, Policy and Practice in Special Education Needs and Framework for Action	1994	International
Disability Standards for Education (DSE)	2005	Australian
United Nations Convention on the Rights of Persons with Disabilities (CRPD)	2008	International
Australian Professional Standards for Teachers	2011	Australian
Nationally Consistent Collection of Data on School Students with a Disability (NCCD)	2013	Australian
United Nations General Comment No. 4, Article 24: Right to inclusive education (GC4)	2016	International

Emergence of inclusive education. The United Nations Declaration of Human Rights (UNDHR) was created in 1948 and documents the international recognition "of the inherent dignity and of the equal and inalienable rights of all members of the human family" and the "fundamental rights to be universally protected" (United Nations, 1949, p. 1). Two Articles are relevant to the discussion of education of students with DLD. Article 19 outlines the right to freedom of expression, including the right to "seek, receive and impart information" (United Nations, 1949, p. 5). While this is most often interpreted as 'freedom of speech', McEwin and Santow (2018) suggest that understanding has evolved, and this Article

is now synonymous with the concept of 'a right to communication'. Meanwhile, Article 26 speaks to "a right to education ... directed at the full development of the human personality" (United Nations, 1949, p. 7).

The 1990 United Nations Convention on the Rights of the Child (UNCRC) reiterates and extends on many articles of the Declaration of Human Rights, emphasising the importance of family in facilitating positive child development (Unicef, n.d.; United Nations Human Rights & Office of the High Commissioner, 1989). Articles most pertinent to students with DLD in school contexts are:

- Article 12, a child's right to have an opinion and to be heard,
- Article 13, a child's right to freedom of expression,
- Article 23, the right of a child with disabilities to a full, decent, and participatory life,
- Article 28, a child's right to accessible primary, secondary, and higher education, and
- Article 29, a child's right to education that offers development to their fullest potential, prepared and able to contribute to a free society (Australian Human Rights Commission, n.d.; Child Rights International Network, 2018; United Nations Human Rights & Office of the High Commissioner, 2018).

To meet these rights for students with DLD, the professional challenge for schools and teachers is to be conscious facilitators of student perspectives and opinions, and to design and deliver learning experiences that minimise language barriers, provide access and participation in the full life of the school, and ensure

these students exit school prepared to be productive and contributing members of society forms (Gallagher et al., 2018; Gillett-Swan & Sargeant, 2018).

Coinciding with international discussion and recognition of human rights across the latter half of the 20th century was a movement to re-shape approaches to disability, using rights-based thinking as a catalyst (Meehan, 2016; People with Disability Australia, 2017; Shakespeare, 1996). In the 1970s and 1980s, the concept of disability began to shift from an internal, personal, medical problem to a public issue of systematic exclusion and oppression, created and perpetuated by an ableist society (Christensen & Rizvi, 1996; Danforth & Jones, 2015). The United Nations International Year of the Disabled Person in 1981 signalled a period of transition (People with Disability Australia, 2017). People whose condition and life had previously been managed by the decisions of medical professionals, institutions and charitable organisations, worked to highlight the social nature of disability (Christensen & Rizvi, 1996; Danforth & Jones, 2015; People with Disability Australia, 2017). This shift in paradigm is important for all people with disabilities, including those with DLD, and represented an intention to look beyond internal personal deficit to consider broader factors that contribute to disability.

In line with this paradigm shift, the 1992 Disability Discrimination Act (DDA; Australian Government, 2016) was passed by the Australian Government, making discrimination on the basis of disability unlawful (Australian Government, 2016; Australian Human Rights Commission, n.d.-b). Discrimination, in the DDA, is defined as being treated less fairly than a person without a disability or due to an association with a person with a disability (Australian Government, 2016). Disability, in the DDA, extends beyond traditional considerations of physical, sensory or intellectual disability, to also include physical disfigurement, psychiatric

conditions, neurobiological conditions, learning disabilities and the presence of "disease-causing organisms" (Australian Government, 2016, p. 5). According to this definition, Developmental Language Disorder constitutes a learning disability, and students with DLD are therefore entitled to the protection the DDA offers. As such, schools and teachers have a responsibility to ensure that students with DLD are not treated unfairly or marginalised due to their disability. For students' language needs to be supported, teachers need to first be able to recognise them for what they are, a language disorder, not the learning, behaviour or literacy need they might first appear to be.

In 1994, the Salamanca Statement and Framework for Action on Special Needs Education, made a significant contribution to the international disability conversation, affirming 'Education for All' (Right to Education Initiative, 2018). The international conference, which was held in Salamanca, Spain, affirmed the key principles of inclusive education and resulted in a Framework for Action (Forlin, 2006). The Framework laid out the intention for all students to be educated at their 'regular' neighbourhood school and stated a need for schools to adapt and adjust to meet students' needs rather than students adapting to fit current schooling (United Nations Educational & Ministery of Education and Science, 1994). For students with DLD, the resulting expectation is that schools and teachers welcome all students in all schools, understand the characteristics and impacts of DLD and reconsider and redesign the learning engagement from traditional language-based modes to multiple modes as a matter of course. The Salamanca Statement also detailed the need to invest in teacher training and support to make inclusive schools that could respond to the extent of student diversity a reality (United Nations Educational & Ministery of Education and Science, 1994). The plan for an international move to inclusive

education post-Salamanca was clear, yet provided a significant challenge to governments, education systems, schools and individual teachers (Danforth & Jones, 2015).

At a national level, Australia issued the Disability Standards for Education (DSE) in 2005. The Standards were developed following complaints of widespread discrimination by parents of children and young people with disability that were documented through the 2002 Senate Inquiry into the Education of Students with Disabilities (Parliament of Australia, 2002). The DSE operationalise the Disability Discrimination Act (DDA) and are designed to make the rights of students and legal obligations of educators easier to understand and enact (Australian Government, 2015b). The DSE articulate three key obligations for education providers:

(i) ensure reasonable adjustments are made to enable a student with disability to "access and participate in education on the same basis as other students",

(ii) consult with the student and the family about the adjustments to be made, and

(iii) eliminate harassment and victimisation of students with a disability and their associates (Australian Government, 2015b, p. 1).

Access and participation are key elements of the DSE and echo Article 23 in the United Nations Convention on the Rights of the Child which advocated for access and participation as necessary for a full and decent life (United Nations Human Rights & Office of the High Commissioner, 1989).

Adjustments are defined in the DSE as measures or actions that assist a student with a disability to gain access and participate in education "on the same basis as

peers without a disability" (Australian Government, 2015b, p. 13), and may be made to support enrolment, access and participation in a course or program and/or access to facilities or services. Adjustments are considered reasonable if they "balance the interest of all parties affected" (Australian Government, 2015b, p. 14), with consideration given to the student's disability, the effectiveness of the adjustment, the impact on the student, school, staff and other students; and the costs and benefits of making the adjustment. As the DSE use the same definition of disability as the DDA, students with DLD are entitled to reasonable adjustments that provide them with access and opportunity for participation, consultation regarding these adjustments and protection from harassment and victimisation, as per all students with a disability (Australian Government Department of Education and Training, 2015). To meet the requirements of the DSE for students with DLD, schools and teachers need to understand a students' profile of language skills, as well as the language demands of the environment, to make a professional determination as to the reasonable adjustments required. Teachers also need to develop a skill set that allows them to consult authentically with students with DLD to obtain their opinion with regard to decisions made about the implementation of adjustments (Gillett-Swan et al., 2020).

On an international level, the United Nations Convention on the Rights of Persons with Disabilities (CRPD) came into force in 2008 and works to reiterate, consolidate and further protect the full and equal human rights and fundamental freedoms for people with disabilities, as outlined in the UNDHR (United Nations Division for Social Policy and Development Disability, 2006). Signatories, including Australia, made a commitment to address "stereotypes, prejudices and awareness" of disability as well as redress "laws, regulations, customs and practices"

that constitute and perpetuate discrimination on the basis of disability (United Nations Division for Social Policy and Development Disability, 2006, p. 5). The CRPD details, in 50 Articles, the specific rights of persons with disabilities highlighting circumstances where rights have been deprived and offers a code of implementation (United Nations Division for Social Policy and Development Disability, 2006). The CRPD does not define disability, but describes it as an evolving concept that involves the interaction between personal, environmental and social/attitudinal factors that cause "barriers to full and effective participation in society on an equal basis with others" (United Nations Division for Social Policy and Development Disability, 2006). For students with DLD, these factors include:

- *personal factors* – the characteristics and impact of the students' language profile,
- *environmental factors* – the language environment and language demands of the planned curriculum, and
- *social factors* – the language to interact with teachers and peers

(Gillett-Swan et al., 2020).

Articles from the CRPD relevant to educating students with DLD are reiterated from past declarations and conventions. These include Article 33, the right to freedom of opinion and expression, which has previously been discussed with relation to the UNDHR, and Article 24, the right to an inclusive education. In this Convention, 'inclusive education' across all levels of education, from primary through to higher education contexts is specified (United Nations Division for Social Policy and Development Disability, 2006). The Article further outlines the expectation that support and learning occur within the regular education setting, not

specialist facilities, to "maximise academic and social development, consistent with the goal of full inclusion" (United Nations Division for Social Policy and Development Disability, 2006, p. 15). Emphasis is also given to the expectation that students who need support, receive the support required (United Nations Division for Social Policy and Development Disability, 2006). The expectations of schools and teachers here align with that outlined in the Salamanca Statement and the DSE, and require schools and teachers to accept, value and teach all students, identify students' support requirements, and provide access and opportunity to participate on the same basis as peers without a disability in any school (Australian Government Department of Education and Training, 2015). This is the entitlement of students with DLD, like all other students with a disability, and is a complex task for teachers as it requires sophisticated and interrelated sets of knowledge and skills, which include:

- knowledge of inclusive education and inclusive practice,
- knowledge of the characteristics and impact of DLD,
- the ability to interpret students' presenting characteristics, and
- the ability to identify and implement relevant reasonable adjustments.

Returning to the Australian context, the Australian Professional Standards for Teachers recognise and explicitly name this type of sophisticated teacher knowledge as an expectation (Australian Institute for Teaching and School Leadership, 2017a; AITSL). These national standards outline what is expected of Australian teachers to ensure quality teaching and optimal learning (Australian Institute for Teaching and School Leadership, 2017b). AITSL (2017b) specifically state that these standards ask for "new levels of sophistication in our knowledge of students and content". Standard 1, which falls under the domain of 'professional knowledge', requires

teachers to know their students and how they learn (Australian Institute for Teaching and School Leadership, 2017a). This standard, with accompanying subcomponents, is outlined in Table 4.

Table 4

AITSL Professional Standards for Australian Teachers - Standard 1

Strand – Professional Knowledge	
Standard 1. Know students and how they learn	
1.1	Physical, social, and intellectual development and characteristics of students
1.2	Understand how students learn
1.3	Students with diverse linguistic, cultural, religious and socioeconomic backgrounds
1.4	Strategies for teaching Aboriginal and Torres Strait Islander students
1.5	Differentiate teaching to meet the specific learning needs of students across the full range of abilities
1.6	Strategies to support full participation of students with disabilities

Teachers are also required to understand student characteristics, as per subcomponent 1.1. There is also an expectation that teachers understand how students learn (subcomponent 1.2) and to make relevant adjustments to provide access and participation for students with disability (subcomponents 1.5 and 1.6). Subcomponent 1.3 makes specific reference to linguistic diversity, highlighting the significance of this for students' learning. This standard clearly articulates the expectations of teachers and the knowledge necessary to meet students' rights and entitlements.

The introduction of a new census and funding model, the Nationally Consistent Collection of Data for School Students with Disabilities (NCCD), in recent years also has implications for the work and expectations of teachers. This model was designed

and implemented to redress the funding inequities and variability of support for students with disabilities across Australian schools (Australian Government Department of Education and Training, 2014b; Gonski, 2011). While the NCCD began life in 2013 as a census tool, it has morphed into a needs-based resource allocation method (de Bruin et al., 2020). This model uses the DDA definition of disability and so encompasses a wide range of students, including those with DLD. In contrast to categorical funding models still active in many Australian states (de Bruin et al., 2020), the NCCD reinforces the DSE by valuing teacher judgement over medical diagnosis and focusing on current classroom adjustments rather than taking a wait-to-fail (discrepancy model) approach (Australian Government Department of Education and Training, 2014a, 2015). The NCCD requires teachers to have deep knowledge of the DSE, the ability to accurately interpret students' presenting characteristics, use sound professional judgement to make appropriate adjustments based on student presentation, and the professional skills to engage in quality differentiated teacher practice, as well as higher levels of personalised planning and support (de Bruin et al., 2020).

The most significant development internationally with regard to progressing inclusive education, since the United Nations Convention on the Rights of Persons with Disabilities (CRPD) came into force in 2008, has been the publication of General Comment No. 4 (GC4) on Article 24: Right to education (United Nations Committee on the Rights of Persons with Disabilities, 2016). GC4 clarifies Article 24 (the right to an inclusive education) and is the most current, comprehensive and authoritative document on inclusive education internationally (Malaquias, 2017, Sep 6; United Nations Committee on the Rights of Persons with Disabilities, 2016). To address confusion about inclusion, GC4 defines inclusive education as:

> …involves a process of systematic reform embodying changes and modifications in content, teaching methods, approaches, structures and strategies serving to provide all students of the relevant age range with an equitable and participatory learning experience and environment that best corresponds to their requirements and preferences. (United Nations Committee on the Rights of Persons with Disabilities, 2016, p. 4).

Moreover, it provides clear definitions of integration, segregation and exclusion to identify educational approaches that incompatible with inclusive education (United Nations Committee on the Rights of Persons with Disabilities, 2016). GC4 works to reiterate and make clear the rights and entitlements outlined in previous declarations and conventions with respect to education for all students. This encompasses students with disabilities being welcomed at local schools, being respected and shown dignity, being provided with access and opportunities to participate, having schools adjust to meet their needs and receiving holistic development and achieving their full potential as contributors to society (United Nations Committee on the Rights of Persons with Disabilities, 2016).

GC4 speaks to the change in philosophy and deep systemic reform required to achieve a new normal, where all students are valued and empowered members of the school community with the same right to education as all other students (Carrington, 1999; Graham & Sweller, 2011). Advocates for inclusive education emphasise that inclusion does not involve any form of segregated education, is not about the placement of students with disabilities into 'mainstream' schools, nor is it about working to 'normalise' students with disabilities, such that they fit the traditional and established concept of schooling (Carrington, 1999; Graham & Sweller, 2011). It is about systems, schools and teachers embracing diversity, redefining values and

beliefs about disability, and acknowledging student rights (Carrington, 1999; Christensen & Rizvi, 1996). This is relevant to students with DLD as they are often disadvantaged and excluded in the fast-paced language-loaded traditional school context. A commitment by State Parties to this clarified Article of the Convention on the Rights of Persons with Disabilities, as Australia has done, is a commitment to rethink, re-evaluate and ultimately reform education systems (Kanter, 2006), for the benefit of all students, including those with DLD.

Expectations of teachers. The culmination of the declarations, conventions, policies, and standards outlined in Tables 3 and 4, is an understanding of the entitlements of all students with a disability, including students with DLD, to a quality inclusive education. They make the expectations about what type of educational provision is expected in schools and by teachers very clear. Ultimately, all students are entitled to an education alongside their peers, in their local school that is accessible and participatory, and develops them to their full potential through consultation and the provision of reasonable adjustments that are tailored to meet their needs (Australian Government Department of Education and Training, 2015; United Nations Committee on the Rights of Persons with Disabilities, 2016). It is essential that schools and teachers conduct their work in a way that meets these rights and entitlements. To meet these expectations, teachers require a depth of professional knowledge across multiple domains and an ability to integrate this knowledge and apply it in their daily work to shape their practice. To enact their responsibilities toward students with DLD, teachers need to integrate overlapping knowledge domains including knowledge of inclusive education and inclusive practice, knowledge of the characteristics and impacts of DLD, an ability to interpret the presenting characteristics and to identify and implement effective adjustments.

The key question, however, is whether teachers have these essential sets of knowledge and skills. This research aims to investigate teachers' knowledge and skills with respect to students with DLD. The findings from this research will have implications for teacher support, training, and ongoing professional collaboration.

Teacher Knowledge of Speech, Language and Communication Needs

The following section outlines, in chronological order, the literature encompassing teacher knowledge of speech, language and communication needs (SLCN). These studies are summarised in Table 5. A broad focus, beyond Developmental Language Disorder (DLD), was necessary in this section of the literature review, as at the time this study commenced, there was only one study that specifically considered teacher knowledge of language, rather than SLCN. The lack of studies focusing on teacher knowledge of language is one identifiable gap within the literature as it stands, suggesting that additional research with this focus would be beneficial.

Dockrell and Lindsay (2001) examined teachers' views and understandings of students with specific speech and language difficulties (SSLD) in England. SSLD was described as those students presenting with a primary issue with some part of their communication system (not relating to other factors or diagnoses) and therefore the focus cohort encompassed students with speech disorders, as well as those with DLD. Dockrell and Lindsay (2001) aimed to investigate (a) teachers views and understandings of students with SSLD, and (b) the level and adequacy of the support students received, as described by teachers. Participants included 69 teachers (59 in mainstream settings and 10 in special education settings), along with 69 Year 3 students identified with SSLD by school teams.

Table 5

Summary of Studies on Teachers and Speech Language Communication Needs (SLCN)/Developmental Language Disorder (DLD)

Authors	Location	Participants	Method	Focus	Aims
Dockrell & Lindsay (2001)	England	Yr 3 teachers (n=69) & their students (n=69)	Interviews & questionnaires Battery of assessments	SSLD *(Similar to SLCN)*	- Know terminology - Know characteristics of SLCN - Confidence in supporting students
Marshall, Ralph & Palmer (2002)	England	Pre-service teachers (n=149)	Survey	Speech and language difficulties *(Similar to SLCN)*	- Attitude to inclusion - Experience with people with SLCN - Barriers to supporting students
Marshall, Stajonovik & Ralph (2002)	England	Pre-service teachers (n=19; portion of participants from previous study)	Semi-structured group interviews	Speech and language difficulties *(Similar to SLCN)*	- Attitude to inclusion - Barriers to supporting students
Sadler (2005)	England	Early years teachers (n=89)	Survey	SLI Similar to SLCN	- Attitude to inclusion - Identify impacts - Confidence in supporting students - Barriers to supporting students

Authors	Location	Participants	Method	Focus	Aims
Mroz (2006)	England	Early years teachers (n=249)	Survey	Speech & language development	- Know typical development - Know atypical development
Dockrell & Howell (2015)	England	Teachers completing Masters of Inclusive Education (n=59)	Survey	SLCN	- Know terminology - Differentiate speech from language - Barriers to supporting students
Girolamo (2017)	USA	Wide range of teachers (n=177)	Survey	SLI *(Similar to DLD)*	- Identify students with SLI - Provide 'treatment' for student with SLI
Dockrell et al. (2017)	England	Wide range of teachers (n=103) Educational speech pathologists (n=67)	Survey	SLCN	- Know terminology - Differentiate speech from language - Know impacts - Barriers to supporting students

Note: SSLD = Specific Speech and Language Difficulties; SLCN = Speech, Language and Communication Needs (SLCN); SLI (Sadler) = Speech/Language Impairment; SLI (Girolamo) = Specific Language Impairment

Dockrell and Lindsay (2001) employed semi-structured interviews to investigate teachers' understanding of speech and language difficulties, relevant training, description of student strengths and needs, ways in which student needs were being met, and experiences regarding resources and collaborations with other professionals. Teachers also completed three standardised questionnaires to assess teacher perception of student language skills and learning progress (using the Junior Rating Scale), as well as behaviour and social skills (using the Strengths and Difficulties Questionnaire, and the Pictorial Scale of Perceived Competence and Social Acceptance for Young Children). Student participants underwent a battery of standardised assessments to provide a reference point to consider alignment between teacher perceptions of and students' actual communication profiles.

This battery of assessments gathered data on language skills (Test of Reception of Grammar, British Picture Vocabulary Scale, Naming Vocabulary from the British Ability Scales, The Bus Story and The Phonological Assessment Battery), learning and attainment (Number skills and Spelling from the British Ability Scales and the Macmillan Individual Reading Analysis), behaviour and social skills (The Strengths and Difficulties Questionnaire and the Pictorial Scale of Perceived Competence an Social Acceptance for Young Children), and non-verbal cognitive ability (Matrices from the British Ability Scales).

Ninety-one percent of respondents, especially those in mainstream settings, had received little to no training to assist them in understanding and supporting the needs of students with SSLD (Dockrell & Lindsay, 2001). Perhaps unsurprisingly, those participants reported gaps in their knowledge and feeling ill-equipped to appropriately support student learning. Ultimately, when describing student support, nine in every 10 respondents felt that they were not effectively meeting the student's

needs. Seventy-five percent of respondents also reported limited access to speech pathology support to assist them to meet student needs and build teacher capacity. Along with knowledge and training, these teachers reported barriers such as time, resources and need for support as impacting on their ability to meet student needs.

Comparing student test data with teacher perception, Dockrell and Lindsay (2001) identified that teachers more accurately understood the learning achievement and needs of their students, but were less clear on language strengths and needs. Forty percent of respondents were unsure of terminology used to describe the range of speech and language difficulties and were unable to provide any information about widely used terms. In summary, the authors asserted that while teachers may identify general impacts, without specific knowledge and training, they "are in the difficult position of reacting to problems rather than planning to meet or prevent difficulties" (Dockrell & Lindsay, 2001, p. 389). They also suggested that while significant research in understanding student language, learning, literacy, and behaviour had occurred by the time of this two decades old study, this knowledge had yet to translate into teaching practice.

Macrory (2001), from Manchester Metropolitan University in the UK, published an article on the topic of child development. He outlined his perspective on the type of knowledge about child language acquisition required by early years practitioners, to effectively identify atypical development and support students. Macrory concluded that knowledge of typical or expected development enables teachers to identify students with atypical development but that a more nuanced knowledge set, beyond key developmental indicators, is needed for accurate identification of students requiring support. This nuanced knowledge is specifically the understanding of individual variation in the developmental path. Understanding

of the range of skills that may still constitute typical language development, avoids rigid application of language milestones and over-identification of students with language difficulty or disorder. Most importantly, Macrory argues, the knowledge of *how* language develops is essential to design opportunities and interventions that provide the most effective support for language development. It is this type and level of knowledge about language development and disorder that allows teachers to make critical judgements about appropriate adjustments to provide students with access to the curriculum.

In another English study, Marshall, Ralph and Palmer (2002) examined preservice teachers' attitudes towards children with speech and language difficulties, rather than knowledge and understanding of the characteristics of speech and language difficulties. In this study, the researchers used the term 'speech and language difficulty' and defined this as "one who does not communicate verbally as well as other children of the same age" (Marshall, Ralph & Palmer, 2002, p. 199). Again, this focus cohort included both speech and language difficulties and is therefore broader than the current study. The authors investigated (a) attitudes of postgraduate education students towards children with speech and language difficulties, (b) experiences of postgraduate education students with people with speech and language difficulties, and (c) implications for inclusive education policies. Participants included 149 preservice teachers, 92% studying secondary education and 8% studying primary education. A survey using primarily closed questions was used to gather data.

Analysis of the data showed that these preservice teacher participants generally held positive attitudes towards working with children with speech and language difficulties regardless of personal experience with people with such needs. Closer

inspection of free form responses however revealed that positive responses were either conditional on additional training, time, and resources or couched in negative terms, e.g., 'Would it be fair to other students?'. The barriers to supporting students with speech and language difficulties articulated by preservice teachers in Marshall et al. (2002), reflected those identified by practising teachers in Dockrell and Lindsay's (2001) study. Teachers' underlying concern about their ability to include students with speech and language difficulties was further illustrated when a large majority of respondents indicated that they felt students with severe speech and language concerns would be most appropriately placed in a special education setting. Overall, Marshall and colleagues asserted that rather than starting with teacher training and resources with regard to speech and language needs, it is essential to simultaneously address attitudes towards inclusion to maximise the impact of any training or resources provided.

Marshall, Stojanovik and Ralph (2002) extended the previous quantitative study of preservice teacher attitudes toward the inclusion of students with speech and language impairments with a qualitative component. A subset of the same participants was used to investigate the nature of preservice teachers' attitudes on the inclusion of students with speech and language impairments, as well as the effect these attitudes had on participants' willingness to teach these students. The authors also considered the implications for speech pathology services. Semi-structured, non-standardised group interviews were used to pursue these areas of interest. The authors reported the emergence of six key themes with reference to the inclusion of students with speech and language impairments, which included: (a) the effect on the student with speech and language impairment, (b) the effect on other students, (c) impact of the degree of difficulty or type of disability, as other types of disability

emerged in discussion; (d) resource requirements, (e) the relevance of the subject to be taught, as participants were studying secondary education; and (f) the role and feelings of the teacher.

Marshall and colleagues (2002) acknowledged that a non-representative sample was used, and that the nature of group interviews led to changes in participant views as discussion progressed. Despite this, the authors stated that participants overall held reservations about the inclusion of students with speech and language impairments. The authors felt this reservation was linked to firm participant views on what constituted a 'typical' student and the unreasonableness of being expected to teach beyond their definition of 'normal'. There also appeared to be an assumption that speech and language impairment was synonymous with intellectual disability. Greatest concern centred around the idea of support and resourcing in the form of time, training, and knowledge in order to engage in inclusive practice. The findings in this study supported previous suggestions (Carrington et al., 2016) that knowledge is a key factor in creating a positive attitude toward student diversity and inclusion; e.g., the more knowledge teachers have about children with a particular disability or need, the more willing they may be to teach them.

In another English study, Sadler (2005) examined teachers' attitudes, beliefs and knowledge of students with speech/language impairment. Sadler did not offer any definition of the term 'speech/language impairment', simply stating that a diagnosis of moderate to severe impairment had been made prior to school entry. Evidenced in the term, however, is the inclusion of students with both speech and language difficulties. A cohort of students with speech/language impairment was followed through their first three years of formal schooling. Their teachers (n = 89:

Reception [first year of school in UK] – Yr 2) responded to a 12-item questionnaire to gather data about their attitudes, beliefs, and knowledge of students with SLI. Sadler specifically set out to investigate: (a) mainstream teachers' knowledge of speech and language impairment, (b) the degree of confidence in their ability to cater for the educational needs of students with speech and language impairment, c) attitudes and beliefs regarding mainstream provision for these students, (d) expectations regarding future educational performance and capacity, and (e) the type and source of additional information and usefulness in meeting their needs as a teacher.

The majority of teacher participants in Sadler's study had not received information in their teacher training (89%) or through in-service training (80%) to assist them to understand and support the needs of students with speech/language impairments. As a result, 88% of participants felt that their knowledge was limited or very limited, and 72% were not confident in their ability to meet the educational needs of students. These teachers also reported limited access to speech pathology support to assist in both meeting student needs and building teacher capacity (only 5% able to access). Participants also reported lack of training, time, resources and support as barriers to effectively supporting students' needs, which aligns with previous findings (Dockrell & Lindsay, 2001; Marshall, Ralph, et al., 2002).

Sadler (2005) also found that teachers felt there were more benefits than disadvantages to mainstream placement for students with moderate/severe speech and language impairments. Noteworthy though, is that 50% of participants did not respond to this question, which suggests this finding may not be representative. Also, teacher responses regarding the likely educational trajectory of students with significant speech/language impairment was varied, illustrating confusion about the

characteristics and impact of such impairments. Overall, Sadler's findings reflect much of what has been identified in previous studies with some unique contributions to understanding this area of inquiry. Sadler suggested that addressing knowledge and training issues along with identified barriers to effective practice will enhance the inclusion of students with speech/language impairment.

Mroz (2006) moved beyond the realm of attitudes to focus on teacher knowledge. Mroz used a survey design to investigate what 294 Foundation Stage teachers (Nursery teachers – students 3-4 years of age and Reception teachers – students 4-5 years of age) in England knew and understood about speech and language. In this study, Mroz investigated the domains of speech and language and focused equally on typical development alongside delay and/or disorder. The study investigated (a) training that had been received on speech and language development, (b) teachers' level of confidence with reference to six key aspects of speech and language (speech sound development, expressive language, social use of language, comprehension, attention and listening, and play and language); (c) teachers' perceived training needs; (d) strategies teachers used to assess and identify speech and language development; and (e) teachers' application of their knowledge in identifying speech and language delays.

Mroz (2006) found that initial teacher training covered most areas of typical child development, though briefly. Fifty-two percent of respondents had pursued additional training in speech and language, usually related to typical development rather than difficulties or disorders. Generally, teachers rated their knowledge and confidence across the six key aspects of speech and language as relatively high (average rating of 12.5 out of a total of 18). This confidence however did not align with their ability to accurately identify atypical development as measured through

three case study questions. For example, 14% of Reception teachers (students 4-5 years old) did not accurately identify the described communication concern for a child within the age range they teach, and 70% of Nursery teachers (students 3-4 years old) did not identify a communication concern for a child six months younger than children they typically teach. These questions were designed to measure the teachers' application of knowledge or 'knowledge in action' as described by the author. Overall teachers reported concern for their level of training especially with regard to accurately identifying speech and language needs and speech sound development.

Dockrell, this time with Howell (2015), examined teachers' knowledge of students with speech, language and communication needs (SLCN). Dockrell and Howell were interested to investigate (a) teachers' familiarity with terminology used to reflect different speech and language difficulties and (b) teachers' ability to differentiate between the needs of children with speech and language difficulties. Theirs is the first study to have considered teachers' knowledge and ability to differentiate between speech disorders and language disorders, rather than combining all types of difficulties under the umbrella term of SLCN. Participants included 59 teachers, all completing a Masters qualification in Inclusive Education, the majority of whom (82%) were experienced in working with students with SLCN. Quantitative data were gathered using an online survey.

Even though these participants were experienced and interested in inclusive practice, results indicated that the majority had not received information about speech (60%) and language (56%) difficulties in their initial teacher training, nor advice on how to support students with speech (68%) or language needs (60%). These teachers still identified this as a barrier in knowing how to support students

with SLCN. Despite their experience working with students with SLCN and more ready access to speech pathologists, these teachers were unfamiliar with and confused by the terminology used to describe speech and language disorders, and experienced difficulty differentiating between speech and language disorders based on student characteristics, as well as differentiating speech/language disorders from other factors such as English as an Additional Language and Autism Spectrum Disorder. Overall, respondents indicated that knowing how to support students with SLCN was their greatest challenge. Given these results, Dockrell and Howell (2015) asserted that it is incumbent upon teachers and education systems to rise to the challenge of identifying, understanding and addressing the needs of students with SLCN to reduce long term negative impacts.

The only study from the USA, a thesis by Teresa Girolamo (2017), utilised a national survey to investigate the extent to which teachers (a) worked with students with disabilities, (b) were able to identify students with Specific Language Impairment (SLI), and (c) provided treatment to students with SLI. The definition of SLI in this study aligns, in large part, with the current definition of DLD. SLI was defined as a language impairment, with poor tense marking as a key clinical indicator, occurring in the absence of hearing loss or other developmental delays. One hundred and seventy-seven teachers from 11 states working with pre-schoolers through to students aged 21, in both general and special education settings, completed an 82-item questionnaire. Half of these respondents worked in special education settings. The questions investigated teachers work settings, services available to students, professional practices and teachers' views on identification, classroom supports, referral for additional support and areas for intervention through six case studies.

Overall, Girolamo (2017) found that almost all teachers were engaging with students with disabilities which was indicated by one or more students in the class having an Individual Education Plan. Just over half the teachers had classes where up to one third of students had medical diagnoses and were receiving speech/language therapy. Teachers were asked to indicate, in multiple choice questions, their general work practices regarding teaching method, emphasis of teaching, approach to academic difficulty, in class interventions they would pursue and collaboration with other education professionals. These areas were then further examined with reference to six student cases. The results indicated that teachers play a role in the identification of student with SLI but that they are not always accurate. While teachers identified common language concerns, more subtle difficulties or those masked by behaviour went unnoticed. Most teachers indicated that they would pursue in-class supports before referring to other educational specialists. Most commonly in-class supports included individual/small group support, differentiation, and monitoring of student performance. When asked to indicate areas for intervention, teacher responses were again variable, often including language targets but also extending to speech, fluency, and other areas. Teachers in this study did not have enough knowledge of language to accurately identify the types of concerns or recognise their significance in order to refer on to others with specialist knowledge, nor determine the key areas for improvement and therefore focus of intervention. Girolamo did not find any significant differences between the responses from general and special education teachers.

Most recently, and as a follow up from the Dockrell and Howell (2015) study, Dockrell, Howell, Leung and Fugard (2017) examined teacher knowledge of SLCN as compared to speech pathologists' knowledge. On this occasion, Dockrell and

colleagues were interested to investigate (a) understanding of terminology, (b) recognition of behavioural indicators of SLCN, (c) knowledge of associated academic needs and behavioural challenges, and (d) barriers to meeting students' needs. Participants included 103 teachers and 67 speech pathologists in England. A modified version, based on feedback, of the questionnaire used in the 2015 study was used to survey both sets of professionals. Of relevance are Dockrell and colleagues' (2017) findings with regard to teacher responses.

A relatively high proportion of teacher participants reported that they had not received information in their initial teacher training about speech difficulties (66%) or language difficulties (61%) or advice on how to support students with speech (67%) or language difficulties (63%) (Dockrell et al., 2017). Ninety-five percent of teachers specifically identified that a lack of specific training in areas relevant to SLCN to be a barrier to supporting students more effectively (Dockrell et al., 2017). this study, teachers were found to be unfamiliar with the vast majority of terminology used with reference to speech and language needs. Participants found it challenging to differentiate speech difficulties from language difficulties which was highlighted when large proportions of participants (25% and above) described 7 out of 11 common communication difficulties as 'both speech and language' rather than being able to specify the difficulty to be either 'speech' *or* 'language' (or 'neither' or 'not sure'). Furthermore, 85% of participants indicated that their difficulties in being able to differentiate between speech and language issues presented a barrier to accurate identification and support. Overall, participants illustrated some awareness of the educational and behavioural issues associated with speech and language difficulties. This was demonstrated by the mean rating on a 5-point Likert scale for all 13 academic/behavioural issues was between 1.95 and 3.23 appropriately

indicating ‘moderate likelihood’ of these as common impacts of speech and language difficulties.

Teachers indicated that they found a profile of student language skills more helpful than a formal diagnosis and that they would benefit from training in the area of SLCN, as well as a tool to assist in accurately identifying SLCN in students. The authors suggested these results begin to illuminate teacher knowledge across the area of SLCN and speak to the potential of partnership and collaboration between speech pathologists and teachers (Dockrell et al., 2017). A further suggestions was the need for teachers to develop deeper functional knowledge of SLCN, in order to understand the relevant learning needs and respond appropriately (Dockrell et al., 2017).

Summary and Implications

Overall these studies indicate that teachers intend to support students with SLCN but lack the functional knowledge and confidence to effectively cater for student communication diversity (Adger et al., 2003; Dockrell & Howell, 2015; Dockrell et al., 2017; Marshall, Ralph, et al., 2002; Marshall, Stojanovik, et al., 2002; Mroz, 2006; Mroz & Hall, 2003; Sadler, 2005). However, most of these studies made use of teacher self-report on closed question surveys as a primary source of data. Teacher self-report through survey design allows for overall views and issues to be captured, but does not provide the option for caveats, qualifiers and reasons to also be identified (Berryman, 1989). This information is important to fully understand teacher knowledge of Developmental Language Disorder (DLD) or Speech, Language and Communication Needs (SLCN). Notable exceptions are Dockrell and Lindsay (2001), who used student assessment data as a reference point for self-reported teacher knowledge, and Marshall, Stojanovik, et al. (2002) who followed up their questionnaire with semi-structured interviews to investigate

attitudes toward students with SLCN. Mroz (2006) also utilised case study questions within the questionnaire to capture application of knowledge as a complementary data source to self-report of knowledge. These types of additional data sources give depth and breadth to investigations of teacher knowledge of DLD and SLCN and may help to highlight issues that have not yet been raised.

Importantly, all studies investigated teacher knowledge sets that align with traditional approaches to disability, such as knowledge to identify characteristics and knowledge of referral points and access to specialist services. Given the international move towards inclusive education and teachers' responsibility to achieve this for all students, investigating the sets of knowledge that teachers need to inform decisions about reasonable adjustments would be timely and pertinent. This M.Phil study investigated the following sets of knowledge and skills:

- knowledge of inclusive education and inclusive practice,
- knowledge of the characteristics and impact of DLD,
- ability to interpret students' presenting characteristics, and
- ability to identify and implement relevant reasonable adjustments.

This M.Phil study sought to build on previous research by extending the range of participants, focusing specifically on DLD, and by investigating teachers' knowledge of inclusive practice.

Participant range. As previous research has been conducted primarily with teachers in England and some teachers in USA, it is vital to gather data regarding Australian teacher perspectives to determine whether the studies conducted to date are reflective of Australian teachers' knowledge related to DLD. Additionally, teacher participants to this point have primarily been narrow cohorts, focusing on

pre-service secondary teachers, early years teachers, teachers known to be teaching students with DLD, or teachers with known experience of DLD. Both Girolamo (2017) and Dockrell et al. (2017) opened up investigation to a wider group of teachers and this current study built further on this work as prevalence data indicates that all teachers are likely to have students with DLD in their classroom (Norbury et al., 2016). The study gathered data from both primary and secondary school teachers, with representation across schooling sectors, and roles in schools.

Focus on DLD. To date, research in this area has generally examined teacher knowledge of the broader category of SLCN. This study narrowed the focus to DLD specifically. The complex nature and nuanced presentation of students with DLD across their time in school warrants specific attention in order to address the misunderstanding that surrounds this disorder (Bishop et al., 2016, 2017; Leonard, 2014). This focus on DLD is a unique feature of this study and contributes to the growing body of research specific to students with DLD.

Role of teacher knowledge. Teacher knowledge informs teacher practice (Athey, 2007; Macrory, 2001; McLeod, 2011; Shulman, 2005; Volpe, 1981). Therefore, investigating what teachers know is a crucial first step in understanding what they do in support of students with DLD. Understanding what Australian teachers know about inclusive education, the characteristics and impacts of DLD, and relevant adjustments to support inclusion is the crux of this project. As such, the research questions for this study are:

1. What do teachers know about the (i) learner characteristics and (ii) educational impacts of Developmental Language Disorder (DLD)?

2. Are teachers able to (i) accurately interpret learner characteristics, and (ii) identify appropriate adjustments to enable access to the curriculum for students with DLD?
3. Are years of experience, training and speech pathology assistance associated with teacher knowledge of learner characteristics, educational impacts, and appropriate adjustments for students with DLD?

Chapter 3: Conceptual Orientation

This study is underpinned by three key concepts: inclusive education, the dilemma of difference, and the role of teacher knowledge in understanding and responding effectively to student difference. This chapter will begin by revisiting the premise of inclusive education and will then consider some of the competing agendas that create tensions for teachers. The chapter will then introduce the 'dilemma of difference' and discuss implications for teachers' work. This will be followed by a discussion of the potential effects of teachers' knowledge and understanding of inclusive education and Developmental Language Disorder on their classroom practice. Finally, the chapter summarises the connection of these themes to the research problem and the study's research questions.

Inclusive Education

Despite espoused commitment to diversity, human rights, community and equity, the systemic reform required to develop inclusive education in Australia has been undermined by conditions that perpetuate integration, segregation and exclusion. There are a number of factors that contribute to what has been termed a "policy-practice divide" (Anderson & Boyle, 2015, p. 6). Artefacts of past medical approaches to disability persist in many forms, including special schools and facilities, forestalling inclusion (Graham & Jahnukainen, 2011). Influences of neo-liberal government policies, such as competitive school markets driven by league tables of student achievement, are incompatible with the philosophy of inclusion (Sweller et al., 2012). The appropriation of inclusive education terminology to describe practices that are not inclusive, also works to confuse and contradict inclusion (Danforth & Naraian, 2015). This divide creates a complex environment

and tensions for teachers' work. Ultimately, Australian education is yet to undergo the systematic reform outlined as necessary in General Comment No. 4 (United Nations Committee on the Rights of Persons with Disabilities, 2016) to progress inclusive education and provide teachers with the optimal conditions to meet their responsibilities to students.

Remnants of a medical model of disability. Historically, disability was understood from a medical perspective. The 'medical model' interprets disability as individual dysfunction requiring examination, diagnosis and treatment to cure or fix the dysfunction (Christensen & Rizvi, 1996). Disability is seen as an unfortunate circumstance of personal affliction to be addressed through intervention, sympathy and care (Christensen & Rizvi, 1996). The medical model underpins special (segregated) education (Carrington, 1999; Christensen & Rizvi, 1996). With respect to DLD, a student's spoken language disorder is perceived as impacting their success in communication and engagement with the learning process. To address this deficit, specific intervention with a specialist is needed to rectify the impacting disorder. The demands of the classroom and environmental factors tend not to be the focus of intervention.

More recently, disability has come to be understood through a social and human rights lens (Danforth & Jones, 2015; Meehan, 2016). This contemporary view of disability acknowledges the person first and foremost, as a person with the same rights and entitlements as all other people (United Nations Division for Social Policy and Development Disability, 2006). Unlike the medical model, it considers disability to be the result of factors external to the person, such as restrictions of the environment and social attitudes (Oliver, 2013). A pure social construction of disability however has received criticism as this model minimises the reality of

human difference and the impact this has on a person's functioning (Shakespeare & Watson, 2001). The social relational model however makes attempts to consider the complex interplay of personal factors (related to levels of personal function) and the social and environmental factors (related to barriers to access and participation) that lead to disability (Reindal, 2008).

This consideration of a complex set of factors that create barriers to access and participation as key to disability, aligns with the principles of inclusive education and the concept of disability outlined in the Convention on the Rights of Persons with Disabilities (Reindal, 2008; United Nations Division for Social Policy and Development Disability, n.d.). Considering DLD through this lens would mean acknowledging a student's limited language competence and working to understand how this interacts with the social and physical environment of the classroom and school to determine the impacts and likely barriers. Equipped with this knowledge, effective work can begin to address the limiting conditions of the environment, as well as building language competence. In this way, optimal 'support' would constitute a combination of adjustments to the context and environment to provide access and participation alongside student focused interventions to build language skills.

Despite policy commitment to inclusive education in Australia, education systems, processes and practices remain influenced by the strongly established history of medical thinking and approaches (Anderson & Boyle, 2015; Meehan, 2016; Slee, 2013). Most notable is the maintenance of a dual system of education, incorporating both 'special' and 'regular' education (Danforth & Jones, 2015; Graham 2015). Rather than supporting a move towards inclusion, this arrangement perpetuates and legitimises segregated education (Chong & Graham, 2017; Graham,

2015). Research has shown that enrolments in special education facilities have been increasing in recent decades, in part due to continued reliance on categorical resource allocation methods which promote an 'identify, diagnose, fund to support/fix' approach (Berlach & Chambers, 2010; Graham & Jahnukainen, 2011; Graham & Sweller, 2011).

Influence of political climate. The prevailing neo-liberal political climate in Australia influences both education and society with regard to disability (Chong & Graham, 2017; Slee, 2013). While there is international talk of diversity, inclusion and community, world views and actions are focused on individuality, privatisation and competition in a neo-liberal or market driven society (Graham & Sweller, 2011; Slee, 2013). These political drivers and the underlying beliefs of individualism and competition, seep into education policy and systems of practice (Chong & Graham, 2017; Graham & Jahnukainen, 2011; Lingard, 2011). For Australia, these competing agendas of inclusion and competition has resulted in a lack of national momentum to engage in systemic reform to make inclusion possible. The neo-liberal market driven influence has led to education reforms that include the introduction of a national curriculum along with national testing, publication of these test results, and methods for rating and comparing schools (Anderson & Boyle, 2015; Graham & Sweller, 2011; Slee, 2013). These developments mean schools are drawn into competition with each other, as parents as consumers of education make choices about where to send their children. This competition risks the education of students who threaten to drain a school's resources (Graham & Jahnukainen, 2011; Graham & Sweller, 2011).

In an effort to achieve and maintain high standing in public league tables, schools develop practices that "sponsor those with strong academic prognoses and jettison those who present with a risk to failure" (Slee, 2013, pp. 895-896). This

leaves students with disability, including those with DLD, vulnerable as schools seek to identify causes for perceived academic failure, creating a student population that is 'unfit' for the world of competition and academic achievement, as it is currently defined (Chong & Graham, 2017; Graham & Jahnukainen, 2011; Slee, 2013). This political agenda has revitalised the medical model, where disability is seen as located within the student and poor achievement is considered a student issue, rather than a school issue (Graham & Sweller, 2011; Slee, 2013). According to Slee (2013), this population of students is then "evacuated to the social margins" and managed through special education (p. 901). There is ambivalence and acceptance of the past traditions of exclusion which in some way accounts for the maintenance of a dual education system, despite its incompatibility with inclusive education and the CRPD (Slee, 2013). Students with DLD form a portion of this vulnerable student population as they do not possess strong language proficiency, which is expected in "mainstream" school settings. Instead their needs are misunderstood and mistakenly attributed to other types of difficulties (Law et al., 2017; Lee, 2013).

Tensions for teachers. Inclusive education is clearly documented as a national and international expectation (Australian Government Department of Education and Training, 2015; United Nations Committee on the Rights of Persons with Disabilities, 2016). The challenge for teachers in actualising this goal lies in both the development of sophisticated and integrated knowledge sets, alongside substantial changes to practice (Australian Government Department of Education and Training, 2015; United Nations Committee on the Rights of Persons with Disabilities, 2016). The residual influence of the traditional medical model, and the competing agendas of market driven politics with those of rights and inclusion, presents a further challenge to teachers. Further complicating the educational

landscape for teachers is the variability that exists across Australian states and territories with regards to inclusive education policies, strategies for implementation, definitions of disability and processes for identifying and funding students with disabilities (Anderson & Boyle, 2015; Berlach & Chambers, 2010; Dempsey, 2011; Meehan, 2016). A number of Australian researchers have urged the development of a consistent definition of disability and inclusion policy for the nation, with co-ordinated and strategic implementation to assist in progressing toward inclusive education (Anderson & Boyle, 2015; Berlach & Chambers, 2010; Dempsey, 2011). Currently, teachers are placed in the difficult position of being the expected 'enactors' of inclusive education in a context and climate that is not conducive to authentic inclusion (Anderson & Boyle, 2015; Berlach & Chambers, 2010). This results in teachers being faced with difficult decisions about how to address student diversity without causing exclusion or discrimination. Unless teachers have the knowledge and skills to enact inclusive education, students with DLD, among other groups of students with disability, will be the casualties of this war of ideals (Rouse & Florian, 1997; Slee, 2013).

Dilemma of Difference

The difficult decision that teachers are faced with when determining the best way to address student diversity can be termed a 'dilemma of difference'. This term was coined by Martha Minow (1990) to describe a point of moral contention or confusion about responding (or not) to difference. Minow's dilemma acknowledges two equal possibilities: the first is that by acknowledging difference, the student may be disadvantaged, marginalised and stigmatised. The second possibility is that ignoring difference and treating all students the same, the student with a difference

may still be disadvantaged, marginalised and stigmatised. Minow frames this conundrum through two key questions:

> "When does treating people differently emphasise their differences and stigmatise or hinder them on that basis? And when does treating people the same become insensitive to their difference and likely to stigmatise or hinder them on that basis?" (Minow, 1990, p. 20)

The dilemma of difference is evidenced in all forums of human engagement, from politics to justice to healthcare to education. It is fundamental to the challenge of realising full and authentic inclusive education (Norwich, 2007).

Teachers working in the context of competing agendas of inclusion, community and equity versus exclusion, individuality and competition will feel this dilemma more keenly. This is because the historic artefact of a medical approach and the pressure of a competitive market-driven society results in forms of exclusion, segregation, disadvantage, and stigma when student difference is identified and acknowledged. In this education climate, the dilemma of difference is real. Acknowledging student diversity does not necessarily lead to more inclusive practice, however, not acknowledging student difference results in all students receiving the 'same' teaching, which leads to exclusion for some. This dilemma of difference is applicable to teachers of students experiencing DLD.

For teachers of a student experiencing DLD, the dilemma of difference can be illustrated through the following two questions:

1. What stigma, exclusion or disadvantage is created by **not recognising** the presence of Developmental Language Disorder?
2. What stigma, exclusion or disadvantage is created by **recognising** the presence of Developmental Language Disorder?

When DLD is not recognised. DLD is prevalent, persistent, pervasive, heterogeneous and often hidden (Bishop et al., 2017; Law et al., 2017; Lee, 2013). Due to its variable presentation and obscure nature, DLD is often unrecognised or misunderstood by teachers (Bishop et al., 2017; Law et al., 2017; Lee, 2013). This has implications for both teachers and students. As discussed in Chapter 2, the impact of DLD on life at school is significant (Bishop et al., 2017; Law et al., 2017). The literature describes negative consequences across a wide range of daily activities and developmental domains including behavioural, social emotional, thinking, problem solving, learning, literacy learning and social interaction (Law et al., 2017). The impacts are also cumulative, compounding to create a complex set of personal, social and environmental factors that create greater and more widespread effects of living with DLD (Clegg et al., 2005; Conti-Ramsden et al., 2009; Dockrell & Lindsay, 1998; Durkin et al., 2015; Lindsay et al., 2007). Poor language competence typically leads to limited literacy learning, which creates a barrier to participating and achieving academically that then impacts on post-school training and employment options (Clegg et al., 2005; Johnson et al., 2010; Whitehouse, Line, et al., 2009; Whitehouse, Watt, et al., 2009). A student experiencing DLD whose difficulties with language are not recognised is disadvantaged in their development, deprived of access to the curriculum and stigmatised for not being able to communicate, socialise, learn and participate in life in the same way as their peers. Lack of identification, acknowledgement and support has serious consequences that result in exclusion, disadvantage, and stigma.

Conversely, the impact for teachers of not recognising when a student is experiencing DLD is also serious (Australian Curriculum and Reporting Authority, 2016; Australian Government Department of Education and Training, 2015;

Australian Institute for Teaching and School Leadership, 2017a). If a teacher does not recognise a student's limited language competence or DLD, they find themselves at risk of failing to meet their obligations under the 1992 Disability Discrimination Act and Disability Standards for Education 2005, as well as the Australian Professional Standards for Teachers (Australian Government, 2016; Australian Government Department of Education and Training, 2015). If a teacher is unaware, does not understand or does not recognise DLD, they are not meeting the first Professional Standard of "know students and how they learn" (Australian Institute for Teaching and School Leadership, 2017a). DLD is a key factor amongst the set of personal factors that a student brings to school, it forms part of "knowing" a student. Similarly, as language is the default mode for learning and teaching, knowing a student's language profile is crucial to knowing how they learn. To extend the line of thinking, if a teacher is not aware, does not understand or does not recognise a student's specific language profile, they cannot be in a position to implement targeted and effective adjustments that provide the student with access to the typically language-based learning opportunities of the classroom. Nor would they be able to consult with the student or their family with regard to appropriate adjustments, as obligated under the Disability Standards for Education 2005 (Australian Government Department of Education and Training, 2015). By not being aware of and/or not understanding DLD, a teacher cannot differentiate to minimise the language barriers, so that the student with DLD is provided with access and opportunities to participate on the same basis as their peers. Due to the obscure nature of DLD, teachers may unintentionally find themselves in this situation. For these teachers, however, it has not been a choice, as per the dilemma of difference, but an accident of ignorance.

When DLD is recognised. The flip side of this dilemma is when teachers recognise a student's language differences caused by DLD. Minnow's question in this circumstance was "When does treating people differently emphasise their differences and stigmatise or hinder them on that basis?" (1990, p. 20). There is evidence to suggest that the formal processes involved in identifying student needs and seeking support in Australia currently do increase the likelihood of exclusion, disadvantage and stigma (Graham & Jahnukainen, 2011; Slee, 2013). The identification of DLD, for example, may result in placement in a segregated special education setting, lower teacher expectations, and/or the stigma of needing to be educated differently. Alternatively, the student may be supported by a teacher aide and/or learning support teacher, which often results in occasional segregation and/or ongoing integration and stigma through the extra attention of 'special' adults. In this case, the difference has been identified but the action has been to highlight the student as 'different'. The recognition of difference has not been translated into understanding and a change in the class teacher's practice that results in inclusion. This situation, given the current neo-liberal influence on education in Australia, is a real possibility for students and teachers (Anderson & Boyle, 2015; Graham & Jahnukainen, 2011; Graham & Sweller, 2011; Slee, 2013).

An alternative exists, however. Through the identification and acknowledgement of DLD with the purpose of understanding and reshaping classroom practice, the student may be granted their rights and entitlement. At the same time, the teacher may also meet their professional expectations. Teacher understanding of the characteristics and impacts of DLD followed by action in the form of consultation with the student and their family, and targeted adjustments that reduce the language barriers to learning, as per the Disability Standards for

Education, can result in an inclusive education for the student with DLD (Australian Government Department of Education and Training, 2015).

Misrecognising the language 'difference' that a student with DLD brings to school leads to disadvantage, exclusion, and stigma for the student by denying them access to the curriculum and their right to an inclusive education. It also places a teacher in a precarious professional position. Identifying and acknowledging DLD, however, has the potential to create disadvantage, exclusion, and stigma of a different sort. In weighing these two options the dilemmas of difference are real and present a genuine conundrum. If, however, identifying and acknowledging DLD is done through respectful identification with the intent of providing greater access to the curriculum through inclusive practice, exclusion, stigma and disadvantage are potentially no longer part of the equation. For this to occur, it is essential that teachers have the appropriate sets of knowledge and understand disability as the complex web of personal, social and environmental factors to be woven to create authentic inclusive practice. The differentiating factor in these possibilities is teacher knowledge and its application to teacher practice.

Role of Teacher Knowledge

It is the work that teachers do in classrooms that ultimately determines whether students are included or excluded (Rouse, 2008). The 'work' is complex and there are high expectations associated with it. Urban (2008) has stated that these high expectations "can only be achieved by a skilled and qualified workforce whose professional practice is guided by a professional body of knowledge" (p. 1). While Urban's reference was specific to the policy initiatives in the UK, these words also hold true for Australian teachers. The role of teacher knowledge is crucial in understanding and navigating the dilemma of difference, as well as implementing

effective inclusive practice. It is these key themes that inform the design of this study. The project is premised on the concept that teachers' professional knowledge is crucial in appropriately supporting students with DLD. The key knowledge and skill being investigated include:

- knowledge of inclusive education and inclusive practice,
- knowledge of the characteristics and impact of DLD,
- the ability to interpret students' presenting characteristics, and
- the ability to identify and implement relevant reasonable adjustments.

The question of 'What knowledge do teachers need to know to be inclusive?' has been investigated by a number of researchers (Fisher et al., 2003; Florian, 2008). Fisher et al. (2003) discussed the depth of knowledge required by teachers regarding specific disabilities. They suggest that teacher recognition of educational support requirements is more informative to a teaching response than knowledge of diagnostic labels, prevalence data and a list of general characteristics (Fisher, Frey & Thousand, 2003). For a teacher of a student with DLD, the 'educational support requirements' equates to knowledge of an individual students' language characteristics and the associated impacts of their language disorder, all of which informs the teaching response, in the form of adjustments. Florian (2008) suggests that what is seen as 'special educational needs' is in fact the "magnitude of difficulty experienced by a learner that exceeds the teachers' capacity to know how to respond" (p. 205).

Therefore, Florian (2008) suggests that teachers should conceive of these 'needs' differently; not as an issue of learning, but as an issue of teaching. This approach by Florian, refocuses the discussion on teacher knowledge and practice. It

also reiterates the suggestion of Fisher et al. (2003), that teachers need to understand their students and the learning to be achieved, then calculate the educational support requirements in order to work out the right educational moves to facilitate engagement and learning and provide the right teaching response. By reframing the presenting issue as one of teaching, and not one of learning, responsibility remains with teachers to understand their students and how they learn, in order to develop an effective teaching response. Foundational to the points made by Fisher et al. (2003) and Florian (2008) is an inherent link between teacher knowledge and teacher practice. The suggestion is that 'knowing' is for the express purpose of shaping the 'doing' and, more importantly, that deeper 'knowing' leads to more effective 'doing'. Developing sophisticated teacher knowledge to respond effectively to a range of student support requirements has the potential to transcend the dilemma of difference. In this way, teachers work to provide greater access to the curriculum through inclusive practices leading to greater advantage, inclusion, and no stigma of students with DLD.

A number of other authors have considered the importance of teacher knowledge with reference to teacher practice (Athey, 2007; Macrory, 2001; McLeod, 2011; Volpe, 1981). The suggestion is that teacher experience does not necessarily equate to sufficient teacher knowledge to result in refined pedagogy. Teaching experience may constitute a wealth of *know how* without crucial *know why* and does not equate to being a competent professional (Athey, 2007; Volpe, 1981). To engage in authentic inclusive practice, or to be able to make astute judgements about appropriate adjustments, there is a need for specific knowledge to be obtained by teachers, and a requirement to operate with deep professional, rather than intuitive, knowledge (Athey, 2007; Volpe, 1981) .

Shulman (2004) outlines six key aspects essential to any profession: service, theory, practice, judgement, learning from experience and learning as a community. Critical to this discussion is intersection between theory (*know why*), practice (*know how*) and the application of professional judgement. Theory is powerful it is presented in neat, intentional, systematic ways to form academic understanding. On the other hand, practice is tainted by variables and uncertainties that make it difficult to see how theory applies to real life. Professional judgement is what is needed to gauge this theory-practice balance in the unpredictable classroom environment. This deep professional knowledge, in the case of teachers of students with DLD, is knowledge of the characteristics and impacts of an individual student's language profile rather than a superficial knowledge of language and language difficulties. This deep professional knowledge is established through combining *know how* with *know why* (Athey, 2007; McLeod, 2011; Volpe, 1981).

McLeod (2011) describes *know how* as practical knowledge of what to do and how to do it, while Volpe (1981) termed the same concept practical wisdom. *Know how* is gained through experience – trial and error, application of rules of thumb and personal engagement, rather than practice based in evidence and theory (Volpe, 1981). *Know how*, independent of *know why*, creates teachers who are rigid and inflexible in their practice, as they do not have the foundation from which to problem-solve the myriad of complexities that arise in classrooms daily (Athey, 2007; Volpe, 1981). *Know why* is the essential partner to *know how* as it provides the foundation of theory, evidence and reason, on which to make sound decisions about the most appropriate course of action (Volpe, 1981). In the case of inclusive practice, *know why* is the basis for understanding the educational support

requirements at any given time, while *know how* is selecting the appropriately matched response or adjustments to include students effectively.

A teacher of a student with DLD operating on practical wisdom or *know how* alone, may implement adjustments that appear reasonable, such as using short simple sentences when giving instructions (e.g. "Write the date in the margin" or "Work co-operatively with a partner"). While this may be supportive of a student whose language difficulty lies in understanding lengthy and complex sentences, it is not helpful for a student who does not understand many word meanings (e.g. margin, co-operate). Furthermore, this adjustment is of no support for a student whose receptive language (understanding) is not an area of concern but has difficulty with expressive language. To be authentically supportive and implement adjustments that provide access and participation for students with DLD, a teacher needs to know, not simply that a student has DLD, but develop a detailed understanding of a students' language profile and the impact it has on their learning. This is the *know why*. Understanding language, its impact on learning and a student's particular profile of language skills positions a teacher to be able to consider and select the most effective adjustments, which is the *know how* (McLeod, 2011).

This deep professional knowledge however is not enough to naturally be converted into pedagogy. For professional knowledge to be converted into effective pedagogy, McLeod (2011) asserts that there is a need for the knowledge to be assimilated and owned by the teacher. This assimilation and ownership can be developed through critical reflection and deconstruction of practice, as well as experience aligning known information with newly acquired knowledge (McLeod, 2011; Volpe, 1981). The power of teacher knowledge, acquired in this way, is that it can more readily be owned and applied (Urban, 2008). Given the need for deep

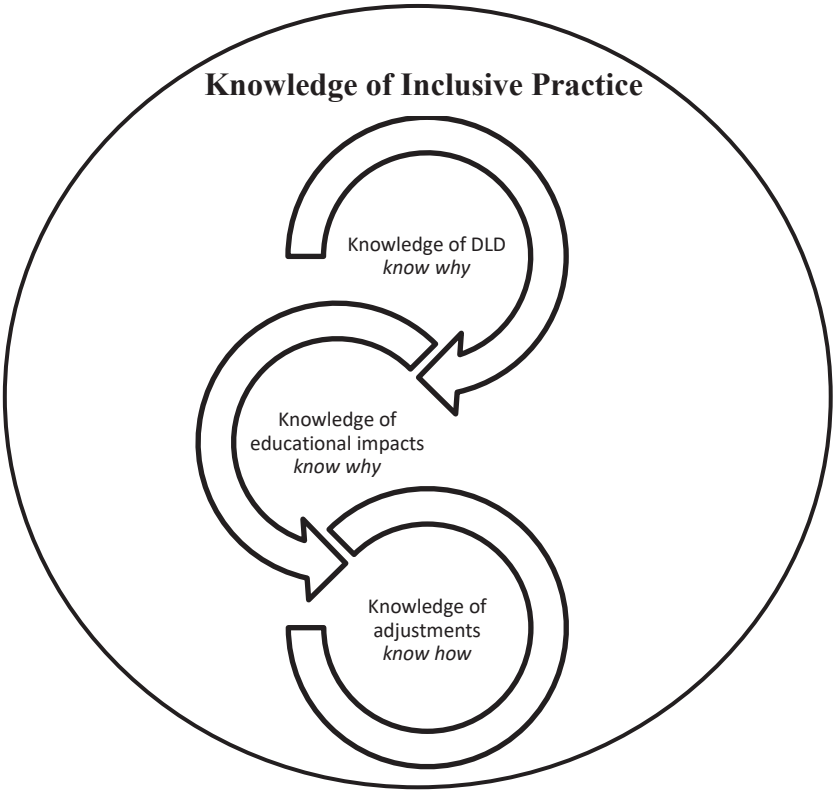
professional knowledge to be developed, assimilated, and owned by teachers, consideration needs to be given to opportunities and processes that teachers can engage in to develop effective inclusive pedagogy. This raises the question of the role of specialists and the contribution of speech pathologists in supporting teachers in this knowledge building endeavour. First and foremost, is the need to develop an insight into what teachers currently know about the characteristics and impacts of DLD and relevant adjustments.

Intersection of Themes

The focus of this M.Phil study is the point at which the key themes of inclusive education, dilemma of difference, and the role of teacher knowledge intersect. The competing agendas related to inclusive education in Australia create a tension for teachers and a genuine dilemma of difference in addressing student diversity. Teacher knowledge however has the potential to assist teachers to transcend that dilemma. To move beyond the dilemma of difference for students with a Developmental Language Disorder (DLD), teachers need to have deep professional knowledge of inclusive education, and knowledge of the characteristics and impact of DLD: in effect, they need to pair the *know why* with knowledge of effective adjustments; the *know how*. Figure 4 illustrates the interaction between these key concepts. Application of these overlapping domains of knowledge may be the key to authentic inclusion of students with DLD, unlocking new possibilities in learning and life beyond school.

Figure 4

The Knowledge Chain: A Representation of Knowledge Domains Investigated in this Project



Chapter 4: Research Design

In this chapter, I detail the research design used to address the three research questions guiding this study. The research questions are restated as a reference point for the research design and methodology which are then described. A general outline and justification are given as to how the chosen design allows for data collection to respond to the research questions. A summary of the target population for this project is followed by a description of the questionnaire used. As this was a custom designed questionnaire, details are provided about the process of development to increase the validity of the data collected. The data collection procedures, including summary of the pre-test and piloting phases, along with the recruitment strategy are then outlined. Finally, data analysis techniques are detailed.

Research Questions

1. What do teachers know about the (i) learner characteristics and (ii) educational impacts of Developmental Language Disorder (DLD)?
2. Are teachers able to (i) accurately interpret learner characteristics, and (ii) identify appropriate adjustments to enable access to the curriculum for students with DLD?
3. Are years of experience, training and speech pathology assistance associated with teacher knowledge of learner characteristics, educational impacts, and appropriate adjustments for students with DLD?

Research Design and Methodology

I used a survey design to address the above three research questions. Survey methodology was chosen to investigate teacher knowledge as it is an effective and commonly used approach that provides descriptive data to help understand

participants' knowledge, perspectives or beliefs (Bell, 2014; Creswell, 2014; McMillan & Schumacher, 2010). Survey design has been used by other researchers investigating teachers' knowledge of speech, language and communication needs (SLCN), as detailed in Chapter 2 (Dockrell & Howell, 2015; Mroz, 2006; Sadler, 2005). This design has the capacity to offer the benefits of both quantitative and qualitative approaches through the mixing of methods (McMillan & Schumacher, 2010). Quantitative data and statistical analysis allow for efficient examination of trends and spread of responses from large groups, while qualitative data and analysis allows for investigation into individual explanations or caveats (Allen, 2017; Berryman, 1989; McMillan & Schumacher, 2010). This M.Phil study employs a QUANT-qual design, which signifies an emphasis on quantitative data analysis with limited use of qualitative data, due to the large number of participants sought and the time burden of qualitative analysis. Given there are no Australian data on this topic, using primarily quantitative data and descriptive statistics to describe the general pattern and overall trends of teachers' knowledge of DLD is a useful starting point (Creswell, 2014; McMillan & Schumacher, 2010).

An online survey platform was adopted as it is versatile, practical and efficient to conduct (McMillan & Schumacher, 2010). While there are limitations to the use of online platforms, McMillan and Schumacher suggest that the benefits of online surveys outweigh the concerns. An online survey offers versatility in terms of number, type and display of questions as well as flexible modes of distribution. Such practicalities were necessary to consider given the scope and timeline of this project. The potential for timely turn-around from release to response, and the ability to distribute to many participants across a wide geographic area, were required efficiencies. Survey Monkey was selected as the preferred platform as it offered the

necessary functions and was the most appropriate option available to the researcher. It featured the desired range of question formats, branching logic, visually appealing designs, varied distribution options, simple navigation, and participant anonymity. Straightforward export to Statistical Package for Social Sciences (SPSS) also minimised data handling and data entry errors as well as ensuring maintenance of participant confidentiality (Creswell, 2014; Fowler Jr, 2013).

One limitation of an online survey is internet access, however, McMillan and Schumacher (2010) suggest that this mode of questionnaire is now commonplace and professionals are adept at using them. This online format was not considered to introduce significant bias as it was assumed that current teachers possess the literacy and technology skills to engage with this format, as well as access to computers and the internet. As response rate and non-response to questions may also be limitations that may impact on data collection, a well-designed questionnaire and effective use of the online platform tools were a focus (Creswell, 2014; Fowler Jr, 2013). Consideration was given to ensuring friendly presentation and ease of engagement with the platform so that participation and completion were not arduous, and returns were maximised (Creswell, 2014; Fowler Jr, 2013). Higher levels of accuracy and honesty in responses were desired in this project and these occur when participant anonymity is offered (Fowler Jr, 2013; Podsakoff et al., 2003). A limitation of online survey methodology however is that participants have unchecked access to internet search functions giving them opportunity to research their responses. These opportunities and limitations were all considered in the design of this study. Table 6 outlines the connection between the research questions underpinning the present study and the measures of teacher knowledge employed.

Table 6

Map of Research Questions and Associated Measures of Teacher Knowledge

Research Question	Knowledge Domain/s and Corresponding Data Gathering Measures
1) What do teachers know about the (i) learner characteristics and (ii) educational impacts of Developmental Language Disorder (DLD)?	*Part i. Learner characteristics* - Self-report - Knowledge demonstration tasks - Description of characteristics *Part ii. Educational impacts* - Self-report - Knowledge demonstration tasks
2) Are teachers able to (i) accurately interpret learner characteristics, and (ii) identify appropriate adjustments to enable access to the curriculum for students with DLD?	*Part i. Interpret characteristics* - Self-report - Knowledge application tasks *Part ii. Select adjustments* - Self-report - Knowledge application tasks
3) Are years of experience, training and speech pathology assistance associated with teacher knowledge of learner characteristics, educational impacts and appropriate adjustments for students with DLD?	*Impact of years of experience/training/speech pathology support* - Relevant demographic data - Self-report - Knowledge demonstration task

Participants

The original target sample for this project was registered teachers in catholic, independent and government schools across New South Wales (NSW) and Queensland (QLD). A two-state comparison was desirable for a broader perspective

on teacher knowledge than would be obtained from a single state investigation due to systemic difference. Given the persistent and ongoing nature of DLD, it was considered valuable to gain the perspectives of teachers across both primary and secondary contexts. A target sample size of 384 was determined using a sample size calculator as a guide with consideration given to sufficient size to minimise sample error and the time investment in analysis of open-ended questions (Creswell, 2014; Fowler, 2009). This number of participants and stratification was desired to minimise sample error associated with a small sample size and allow for valid inferences to be drawn from the data (Fowler, 2009).

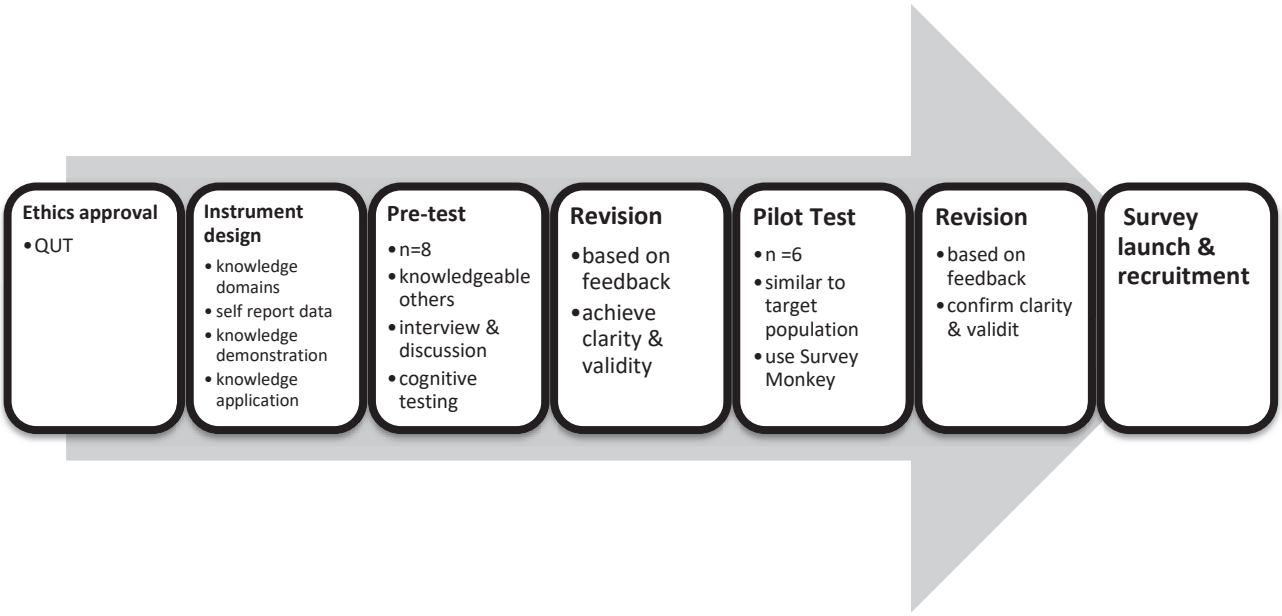
The intention was to gather a stratified sample to reflect the distribution of teachers across both states: 60% (n=234) NSW participants and 40% (n=154) QLD participants (Australian Bureau of Statistics, 2018). Recruitment did not net the intended sample size from NSW, nor allow for stratification across states. For this reason, data analysis was conducted only on the Queensland sample. A breakdown of results for NSW participants is provided in Appendix B. Recruitment processes are detailed later in the chapter.

Procedure

The data collection of this study comprised seven steps outlined in Figure 5. Ethics approval was the initial step followed by pre-test and pilot testing of the questionnaire. Pre-testing and piloting assisted in revising and refining the instrument. The online questionnaire was then launched and monitored for completed responses.

Figure 5

Outline of Study Procedure



Ethics approval. As an initial step, ethics approval was sought from the QUT University Human Research Ethics Committee (UHREC) and low-risk project approval granted (Ethics Approval Number 100001050). This occurred before any data gathering commenced as per requirements of National Health and Medical Research Council (Australian Research Council, 2007, updated 2015). As the recruitment strategy did not involve focused pursuit of participants from any specific education sector or body, no further ethics applications were required.

In accordance with ethical research with humans, design of this project was framed by the four core values stated in the National Statement of Ethical Conduct in Human Research (Australian Research Council, 2007, updated 2015): respect, justice, beneficence and research merit. Overall, efforts were made to minimise the adverse consequences for participants and maximise the benefits to all parties. As the nature of survey research is to understand and describe a population's characteristics, rather than intervene, it lends itself to a low level of risk for

participants (Australian Research Council, 2007, updated 2015; Creswell, 2014; Fink, 2012). Contributing to the low-risk nature of this study, was the voluntary engagement by adult participants from a non-marginalised population (Fowler Jr, 2013). Relevant information was detailed for participants on the initial page of the questionnaire (see Appendix A).

While low risk was inherent to the research design, participants were also actively protected, and their autonomy acknowledged. The survey was succinct, taking an average of 15 mins to complete, to limit the inconvenience of a significant time commitment (Fink, 2012; Fowler Jr, 2013). In addition to this, clear communication to participants informed them of the research intent, data use and storage, and the voluntary nature of engagement (Fowler Jr, 2013). Participants were assured of the anonymous nature of the survey, as no names or other identifying information were gathered (Fowler Jr, 2013). Only electronic data were gathered and used through secured platforms and protocols, in line with QUTs Guidelines for the Management of Research Data (Baker & De Vine, 2015). The overall contribution and merit of this study to the wider community has been outlined previously, however incidental benefits to individual participants were incorporated. At the completion of the survey participants were provided with links to quality sources of publicly available information about DLD relevant to teachers to build their awareness and understanding.

Instrument Design. This study employed a custom designed online questionnaire as no instrument existed that allowed the research questions to be addressed. Past studies also used questionnaires to examine teacher knowledge. While the aims of this study do not directly align with past studies (as described in

Table 5, Chapter 2), the approaches, question types and concepts used in the studies below informed the design of this questionnaire.

- Dockrell and Howell's 2015 study used key questions to see if teachers could differentiate between speech difficulties and language difficulties.
- Girolamo's 2017 thesis used scenarios to gauge teachers' knowledge and skills in supporting student with language disorders.
- Mroz's 2006 project also used scenario questions when investigating teachers' ability to identify typical versus atypical language development.

Central to the design of this project is the strategic collection of both direct and indirect measures of teacher knowledge. Using both measures of teacher knowledge ensures multiple sources of data are gathered and triangulated in the analysis phase. Self-report data are considered indirect, and somewhat subjective, measure of knowledge and were utilised in this project as one source of data (Bradburn, 2004; White et al., 2015). To reduce this subjectivity, direct measures of teacher knowledge were also included. Direct measures were obtained through participant responses to questions that asked them to demonstrate or apply their knowledge in a way that provided consistent data for comparison. Knowledge demonstration involved a participant illustrating their knowledge through a question with a specific focus (e.g., prognosis of DLD). Knowledge application questions used scenarios which required participants to consider and apply their knowledge to realistic student and classroom situations.

Stark et al. (2016) used both indirect and direct measures in their study on teacher knowledge and self-rated ability in language and reading instruction in Australian early years classrooms. This approach allowed for the comparison of data produced by the different measures. The results of the Stark et al. study revealed that

participants self-rated abilities were overestimates when compared to the direct measures of knowledge and skill. A similar approach was taken in this project so that multiple measures of teacher knowledge could be gathered and triangulated in the data analysis phase, leading to a deeper understanding of teacher knowledge in each domain.

The research questions provided the structure for the design of the questionnaire and careful consideration was given to developing questions that would accurately measure the constructs being investigated (Fowler Jr, 2013). Attention was given to the selection, ordering and wording of questions as question design can positively or negatively impact these factors (Fink, 2012; Fowler Jr, 2013; Pike, 2011). Consideration was also given to the impact of social desirability of questions, priming effects, item ambiguity and scale design to minimise method bias (Podsakoff et al., 2003). Questions seeking participants' independent thoughts on DLD characteristics and adjustments were placed early in the instrument so that information could not be ascertained from the more targeted knowledge demonstration questions, therefore minimising priming effects. Questions were written in non-confrontational manner (e.g., "What do you *think/feel…?"* rather than "What *is*…?") to encourage honest responses rather than attempts to deduce the right or desired answer (Bradburn, 2004; Podsakoff et al., 2003). Question formatting and scales throughout the questionnaire were kept consistent, where appropriate, to maximise clarity. Pre-test and piloting phases were implemented to help minimise item ambiguity.

Pre-test and Pilot. Robust pre-test and piloting processes were necessary to review and refine the questionnaire. These steps were completed to trial and refine the instrument based on feedback. Aligning with recommended practice,

knowledgeable others in the field of DLD and inclusive education were approached to take part in the pre-test (McMillan & Schumacher, 2010).

Initially dynamic and informal pre-testing was conducted with two groups of educational speech pathology colleagues who were asked to consider the questionnaire from a teacher's perspective (Brace, 2018). The first discussion with four colleagues obtained feedback on the clarity of the participant information sheet and the draft scenarios. This discussion also involved a brainstorm of adjustments to align with each scenario. Necessary revisions were made prior to a second discussion, which occurred with three different speech pathology colleagues. This meeting obtained feedback on the full questionnaire and suggestions for the most helpful adjustments for each scenario. These were discussed and further refined with the supervision team.

The final stage of pre-test utilised what Brace (2018) refers to as cognitive testing. This involves one or more participants from the target population providing direct feedback and commentary as they complete the questionnaire to help gauge question comprehension, retrieval of information, judgement about relevance of information retrieved and considerations of question responses provided (Brace, 2018). A teaching colleague with no specific disability, language or inclusive education background engaged in this process with the candidate. Strategic questioning was used to elicit information about the participants thought processes and identify ambiguities, misunderstandings, and appropriateness of response options. Based on the feedback, final edits were made to the questionnaire prior to the piloting phase.

The piloting process trialled the draft questionnaire with teacher participants, who closely represented the target population of this project to gain authentic

feedback. The Survey Monkey platform was trialled too as part of this process, and involved assessment of the viability of the platform, error testing on routing of questions, and determining time for participant completion (Brace, 2018). The pilot instrument, including participant information, was shared with 10 pilot participants, and included free text options for feedback at the end of each section. Six of the 10 pilot participants completed the draft questionnaire. The responses and direct feedback were considered by the candidate and supervisors before final adjustments were made to the questionnaire. The pilot responses were not included in the final data set and these participants were asked not to engage with the survey once it was released.

The final questionnaire consisted of 28 questions, although individual participants may have responded to a larger or smaller number due to branching logic or multiple response/matrix type responses. Overall, there were 17 demographic questions; four about learner characteristics; two about educational impact, three investigating ability to interpret learner characteristics and five educational adjustment questions. An additional two questions investigated engagement with speech pathology support, two explored perceived prevalence of students with DLD, and one inquired into relevant training on language development and disorder. The full questionnaire is in Appendix A and a summary of questions is provided in Table 7.

Table 7

Overview of Questionnaire Designed for this Project

Domain of Investigation (Link to Research Questions)	**No. of questions**	**Type of question**
Demographic information	15 2	Closed, multiple choice Open free text
RQ1. Part i. Knowledge of learner characteristics *required to understand the source of educational impacts*	1 2 1	Self-report – part of a matrix Knowledge demonstration – multiple choice/matrix Open free text
RQ1. Part ii. Knowledge of educational impact - *required to make sound professional judgements about adjustments*	1 1	Self-report – part of a matrix Knowledge demonstration – matrix
RQ2. Part i. Ability to interpret students' presenting characteristics - *necessary to select appropriate adjustments*	3	Knowledge application: Identification – scenarios
RQ2. Part ii. Knowledge of adjustments - *required to meet teacher obligations and students' rights*	2 3	Self-report – part of matrix Knowledge application: Selection of Adjustments – scenarios

Domain of Investigation (Link to Research Questions)	No. of questions	Type of question
RQ3.		
Additional investigation		
• Impact of experience	*1*	*Demographic data, from above*
• Impact of training	*1*	*Demographic data, from above*
• Impact of speech pathology assistance	*2*	*Demographic data, from above*
- *on self-rated knowledge and demonstrated knowledge of characteristics of DLD*		

Self-report knowledge. Data were gathered through self-reported knowledge. A single matrix question asked participants to rate their ability in key domains that aligned with the research questions:

1. Recognise common characteristics associated with DLD
2. Recognise the educational impacts of DLD
3. Identify the language demands in their pedagogy
4. Use appropriate adjustments to support students with DLD

Studies of teacher knowledge and attitudes typically rely on teacher self-report (Dockrell & Lindsay, 2001), which was a central component of the Mroz (2006), Sadler (2005), Girolamo (2017), and Dockrell and Howell (2015) studies. Self-report data is an indirect measure of knowledge and has limitations that can lead to overestimates of knowledge and discrepancies between reported and actual knowledge (Dockrell et al., 2017; Pike, 2011). Overestimates of knowledge in self-report data is common due to the influence of social desirability or the participants'

perception that it is expected for them to have a certain level of knowledge on a topic (Pike, 2011; Podsakoff et al., 2003). Despite this, self-report data is valuable to measure to see if teachers' perceptions align with their actual knowledge or skills and will inform future recommendations. These indirect self-report measures were complemented in the design by knowledge demonstration and knowledge application tasks.

Knowledge demonstration. Four knowledge demonstration questions were used to gather additional data. Each question focused on a specific aspect of DLD and allowed the participant to consider what was being asked, reflect on their own knowledge and determine alignment with options presented (Brace, 2018). As outlined in Table 7, knowledge demonstration tasks were used to gather information about participant knowledge of learner characteristics, specifically: common characteristics of learners with DLD, the longevity or prognosis of DLD, characteristics of language difficulties compared to speech difficulties, and classroom activities likely impacted by DLD.

Knowledge application. Scenario based questions also formed a key component of this questionnaire and operated as a counterbalance to self-reported knowledge. These questions were designed to obtain a more direct and objective measure of teachers' knowledge when applied to a simulated realistic circumstance. The scenarios investigated participants' ability to interpret the presenting characteristics of DLD, as well as select appropriate adjustments. Each utilised a consistent format, consisting of a:

1. Student description including information about their learning, relationships, and classroom engagement,

2. Multiple choice question asking participants to identify the most likely source of impact on the student's learning,
3. Multiple choice question asking participants to select the four most helpful adjustments, based on the student description and the most likely source of impact they chose in the previous question.

Identification Task. Each scenario described students in different year levels and with different primary difficulties impacting on their learning. A range of year levels were chosen to cater for participants across both the primary and secondary phases of schooling. Three different likely sources of difficulty were chosen to determine whether participants could differentiate DLD from other disorders that affect learning. The student descriptions were provided in a short paragraph so as not to overwhelm participants but included general information that would be observed or known to a typical teacher. Student descriptions included key indicators of the learning concern, alongside other pieces of information that typically co-exist to represent the complexities of real-life pedagogical decision-making. Participants were asked to indicate the most likely source of impact on the students' learning based on the description provided in the scenario. Participants were provided with 11 choices (Table 8), which were consistent across all three scenarios and presented in alphabetical order.

Table 8

Choices of Most Likely Source of Impact for Scenario Questions

	Primary Characteristic Impacting Learning
1)	Attention Deficit Hyperactivity Disorder
2)	Autism Spectrum Disorder
3)	Childhood Complex Trauma
4)	English as an Additional Language/Dialect
5)	Developmental Language Disorder
6)	Hearing Impairment
7)	Intellectual Disability
8)	Learning difficulties
9)	Literacy difficulties
10)	Social/emotional difficulties
11)	Speech Sound Disorder

Scenario 1 – Speech Sound Disorder (SSD). Students with SSD make speech sound errors. When many sounds are made in error, a student's intelligibility can be very limited, impacting their interactions (Dodd, 2013). The scenario description of Jaydin highlights some of these characteristics (Table 9). Students with SSD are commonly "difficult to understand" due to sound errors which can lead to many "misunderstandings" with peers and adults at school. Some students tire of repeated attempts to make themselves understood and may "abandon the interaction[s]" and become "very quiet" instead. Sometimes other students notice the speech sound errors which may result in the student with SSD "being teased". Students with SSD may have difficulty with early sound-based literacy instruction causing them to be in

"the bottom group for reading". While SSD can co-occur with DLD, the scenario describes a student with only SSD.

Table 9

Scenario 1 – Jaydin, Year 1

Jaydin is in Year One. He is typically ***very quiet*** and is having difficulty making friends. When he does talk, he is ***difficult to understand***. If he is not understood by someone, he tends to ***abandon the interaction*** rather than try again. Jaydin is in the ***bottom group for reading***. He can be ***disruptive*** in small group literacy focused tasks and will sometimes ***remove himself*** from the group. He loves sport and is keen to join in group games however there are ***often misunderstandings***. When these misunderstandings occur, Jaydin ***lashes out*** at his peers. He has complained to his mother about ***being teased*** with other kids asking him to ***say, "Worcestershire Sauce"***. In term ones' parent-teacher meeting, his mother said that Jaydin was ***late to talk*** but that he will ***"talk the ear off"*** people he knows well about his favourite topics – sports and horses. *What do you feel is the primary characteristic impacting on Jaydin's learning?* Please consider all options provided.

These students do have language skills and stories to share and so may "talk the ear off people" when presented with the opportunity in a safe communication environment. There is a strong link between communication difficulties and both internalising ("remove himself from the group") and externalising behaviours ("disruptive" and "lash[ing] out") due to the challenge and frustration of not being able to communicate clearly. The literacy and behaviour concerns were included as real-life illustrations of a student with SSD but also as possible distractors as these difficulties are not always linked back to the SSD.

Scenario 2 – Attention Deficit Hyperactivity Disorder (ADHD). Students with ADHD are described as inattentive, impulsive and hyperactive (Van Lieshout et al., 2013). Characteristics associated with these three traits were emphasised in the

description of Moses in Scenario 2 (Table 10). Inattention causes students with ADHD to "miss key pieces of information" and get in trouble for "not following instructions". Impulsivity can lead to "many errors" in their work. Hyperactivity can lead to students "mov[ing] around" during seat work or "talking during class time". Together, these three traits affect organisation (ability to "finish work", come to class prepared with "books and pens", and to "begin and complete tasks"). Extraneous information on place of birth and immigration to Australia was added, however, the weight of this information was qualified by the addition of age of immigration. Students in Year 4 are typically nine years old, meaning that Moses has been living in Australia for seven years and commenced primary school here. No information was provided in the scenario about non-English language background. Again, while ADHD is known to co-occur with DLD, the scenario here was describing a student with ADHD only.

Table 10

Scenario 2 – Moses, Year 4

Moses was born in Sudan and migrated to Australia with his parents at age two. His teacher is concerned about his learning across curriculum areas. He ***rarely finishes work*** and what he does produce has ***many errors***. While Moses appears keen to learn, he seems to ***miss key pieces of information***. In the classroom Moses likes to take on the 'helper' role. He ***moves around*** offering to do jobs ***even when he should be working***. He often ***comes to class without his books and pens***, ***takes a long time to begin and complete tasks***, and ***spends much of class time talking*** to the students next to him. He often ***gets in trouble for not following instructions***. *What do you feel is the primary characteristic impacting on Moses' learning?* Please consider all options provided.

Scenario 3 – Developmental Language Disorder (DLD). Students with DLD will have difficulties with language and other activities as a result of these language difficulties. The red flags, or common language characteristics (Table 1) and impacts (Table 2) were used to construct this scenario. Difficulties with language across the key domains of language content – words and word meanings, language structure – morphology/grammar and syntax, and language use – using language appropriate for the context have been included (Bloom & Lahey, 1978). Content and structure difficulties can manifest as "poorly constructed sentences, many grammatical errors and generic vocabulary" in both spoken and written language. These difficulties can affect understanding and speaking. In the classroom it may seem as though the student "doesn't listen" and therefore "fails to follow directions". It may also be difficult for a student to "talk about [their] learning" as they do not have the academic vocabulary nor range of sentence structures to do this well. A students' poor expressive language skills can leave a listener "confused" and "need[ing] to clarify" as the student's "meaning [was] not clear". Generating a personal narrative requires integrated use of all language domains and without such skills the account may be stilted, lack cohesion and seem inconsistent. This can lead to the listener questioning if it is a "truthful" account (Snow & Powell, 2012).

These are all characteristic language features however with DD there are also characteristic functional impacts as well as compounding impacts (Table 2). The oral language difficulties of DLD compound to affect written language capacity resulting in students "actively avoid it [written work]" and these difficulties further compound to result in students achieving below expectations and receiving "poor grades". Another functional impact of students with communication difficulties is associated behavioural concerns, sometimes in the form of "explosive behaviour".

This is due to the challenges faced in communicating effectively and efforts to learning through a mode that is not their strength. Due to the multitude of factors making school challenging for students with DLD, some come to "dislike school" as they find it difficult and are misunderstood by their teachers.

Table 11

Scenario 3 – Tom, Year 10

Tom's teachers are concerned about ***poor grades*** and ***explosive behaviour***. He dislikes school and had ***behaviour incidents*** recorded most days. When Tom tries to explain these incidents, ***he does not sound truthful*** and his ***Head of Year is confused*** about what went on. Tom rarely submits assignments and is achieving 'Ds' and 'Es'. He detests writing and ***actively avoids it***. The written work he does produce contains ***poorly constructed sentences, many grammatical errors and generic vocabulary***. Tom also has ***difficulty talking about his learning***. His responses to questions and explanations often ***need clarifying*** as ***the meaning is not clear***. His teachers are frustrated as Tom often ***doesn't listen and fails to follow their instructions***. *What do you feel is the primary characteristic impacting on Tom's learning?* Please consider all options provided.

Selection of Adjustments. The final component of each scenario asked participants to select the four most helpful adjustments for the student described in the scenario. Participants were not provided with the correct primary source of difficulty from the previous part of the scenario but made their choice of adjustments based on what they had perceived the most likely source of impact to be. Participants were provided with the same 12 options of adjustments in each scenario. Table 12 illustrates the most helpful adjustments based on the primary source of difficulty and the details specific to each scenario.

Table 12

Summary of the Four Most Helpful Adjustments Determined for Each Scenario

Adjustments	Scenario 1 SSD, Yr1	Scenario 2 ADHD, Yr 4	Scenario 3 DLD, Yr 10
Ask student to show what they mean (e.g., act out, gesture, draw)	✓		✓
Behaviour plan		✓	
Cue attention to important information		✓	
Demonstrate learning through multiple modes (other than speaking/writing)	✓	✓	✓
Explicit (oral) vocabulary teaching			✓
Extra time to answer questions or share thinking	✓		✓
Monitor phonics and spelling development	✓		
Reduced curriculum expectations			
Reiterate key points		✓	
Social skills sessions			
Speech and/or language therapy (1:1 targeted intervention)			
1:1 teacher aide time			

While some of the other adjustments listed may also be considered helpful to the students in the scenarios, the four *most* helpful adjustments for each scenario were the focus and these were determined through the pre-test process and piloting phases. During pre-test two rounds of conversation were held with seven experienced educational speech pathology colleagues, each with 10 years of experience in working in school. The first discussion involved four speech pathologists who provided feedback about the clarity of the scenarios and assisted in generating a list

of adjustments relevant to the students' needs described in each scenario. A follow up discussion with three more colleagues focused on clarifying the wording of adjustments, generating additional adjustments and linking key adjustments to each scenario, especially the students described with SSD and DLD. The final decision about most helpful adjustments for all three scenarios was made in conjunction with my principal supervisor who has a research background in ADHD. The options were further refined based on responses obtained from the pilot. The next section provides justification as to the selection of the four most helpful adjustments for the purpose of this project.

Distractors. The adjustments of reduced curriculum expectations, social skills sessions, individual speech and/ or language therapy and 1:1 teacher aide time were included in the list of adjustments to enable the researcher to assess teachers' knowledge of inclusive practice and reasonable adjustments. These options were selected as they are either inappropriately used in Queensland schools (e.g., reduced curriculum expectations through Individual Curriculum Plans that place students on a lower grade level) or commonly sought out by teachers (e.g., social skills, SL therapy, teacher aide time). While skill building through speech and language therapy is a supportive and necessary intervention to build students' language skills (Paul & Norbury, 2012), it does not align with the definition of reasonable adjustments by Cologon and Lassig (2020) which is defined as an action by a teacher to minimise barriers and provide access to the curriculum.

Adjustments common to all three scenarios: SSD, ADHD & DLD. There was one adjustment that was determined to be within the top four most helpful adjustments for all three scenarios. Students with SSD, ADHD and DLD all have difficulties in conveying their learning through accurate and coherent spoken or

written language. Allowing them to demonstrate learning through multiple modes gives them the opportunity, on the same basis as their peers, to show what they know. This adjustment aligns with one of the key principles of Universal Design for Learning, which is a "flexible and responsive strengths-based approach to teaching" (Cologon & Lassig, 2020, p. 183) that gives access to learning opportunities for all students.

Scenario 1 – Speech Sound Disorder (SSD). The three other most helpful adjustments for the student with SSD were (i) asking the student to show what they mean, (ii) giving them extra time to respond, and (iii) monitoring of phonics and spelling development. Asking students to show what they mean and giving them extra time to respond are helpful for students with SSD because their speech is often unintelligible, and these students need to be given the time and the means to communicate their messages and demonstrate their learning in the classroom context. Monitoring of phonics and spelling development is also critical for students with SSD because these skills both rely on the phonological system (map of sounds in the brain) in order to work effectively and this is a known difficulty associated with SSD (Sices et al., 2007).

While other adjustments may appear helpful in the list of 12 provided, they are not as helpful as the four identified above. For students with SSD, there are communication breakdowns and "misunderstandings" however these are related to speech sound production and poor intelligibility, as opposed to language difficulties. Adjustments such as explicit oral vocabulary teaching, cueing attention to important information and re-iterating key points does not assist the speech sound issue or the clarity of message. While social interaction ("difficulty making friends" and "being teased") and behaviour concerns ("lash[ing] out" and "be[ing] disruptive") were

noted in the scenario, a behaviour plan nor social skills sessions address the crux of the issue, which is the student's ability to communicate their message.

Scenario 2 – Attention Deficit Hyperactivity Disorder (ADHD). In addition to demonstrate learning through multiple modes, the three other most helpful adjustments for the student with ADHD in Scenario 2 were (i) cue attention to important information, (ii) reiterate key points, and (iii) a behaviour plan. These adjustments were determined to be the most helpful as students with ADHD "miss key information", "get in trouble for not following instructions", making "many errors" in or failing to "finish work", taking a long time to "begin and complete work", not coming to class prepared with "books and pens", "talking" or "mov[ing] around" class during teaching time (Scenario 2). Cuing attention to important information and reiterating key points are adjustments that teachers can make to their pedagogy to help students with ADHD keep abreast of what they need to know to be successful in the classroom. Similarly, a well-constructed positive behaviour plan is an adjustment that can support students with ADHD with strategies to improve their focus, organisation, and time on task (Beamish & Bryer, 2019).

While several of the other adjustment options listed are also helpful for students with ADHD, they are not as helpful as these four. For example, students with ADHD can experience communication difficulties but generally not for the same reason as students with DLD. While ADHD and DLD are both neurodevelopmental disorders, each have a distinct nature (Bishop et al., 2017; Redmond, 2004). ADHD is essentially a disorder of executive function resulting in inappropriate levels of inattention, impulsivity and hyperactivity (American Psychiatric Association, 2013) while DLD is a disorder of linguistic knowledge and

skill. For example, a student with ADHD, may experience a communication breakdown as a result of inattention (e.g., missing what is said), rather than language incomprehension. As such, attention cues and reiteration will be of more help than, for example, explicit vocabulary teaching. Importantly, "miss[ing] key pieces of information", "not following instructions" and "talking" in class were the only characteristics mentioned in Scenario 2 that relate to communication. None of the adjustments in the list were better suited to addressing these issues than the four selected.

Scenario 3 – Developmental Language Disorder (DLD). For the student described in Scenario 3 with DLD, the three other most helpful adjustments, in addition to demonstrate learning through multiple modes, were (i) asking the student to show what they mean, (ii) giving extra time to respond, and (iii) explicit oral vocabulary instruction. Asking the student to show what they mean and giving them extra time to respond can help mitigate the impact of the amount, pace, and level of language in the classroom on their language systems. These adjustments may help a student to "explain incidents" with more clarity and "talking about [their] learning" more effectively. These adjustments also give the student the time and means to convey their message and engage in learning. Explicit oral vocabulary instruction is also helpful to many students with DLD, as "generic vocabulary" can be a common factor which impacts on learning new concepts and using curriculum relevant terminology (Bishop et al., 2017).

While other adjustments amongst those provided may seem helpful for a student with DLD, they were not as helpful as the four adjustments identified. Students with DLD have difficulty understanding and/or using language. Cueing

attention to important information and re-iterating key points may appear helpful to students with DLD, but this is highly dependent on whether the level of language in this information is accessible to them. Monitoring phonics and spelling development would be an appropriate strategy for many students with DLD, as the phonological (sound) system can be impaired in some students' profile of language skills (Bishop et al., 2017; Snow, 2016), however, the student description in Scenario 3 did not specify phonics or spelling concerns, nor would it be appropriate to simply be monitoring these skills for a student in Year 10. A behaviour plan and social skills sessions may be considered helpful to a student with regular "behaviour incidents" and "explosive behaviour", however, these adjustments don't address the cause of the behaviours as they do not address the barriers created by complex language environments and tasks.

Data collection and recruitment. The final instrument used for data gathering was launched on the Survey Monkey platform on 31 July 2019 and closed on 20 November 2019. The project information and survey link were actively distributed through a variety of teaching organisations, groups, and networks on social media platforms. University alumni, teacher unions, closed and monitored teacher Facebook groups and Twitter were used to distribute the questionnaire (Table 13). When any professional organisations declined to distribute the information and link, additional organisations were approached to increase the number of respondents. Responses were monitored regularly for total number, number complete, number attempted and distribution of responses.

Table 13

Organisations and Groups Approached for Distribution of Questionnaire

Organisations – General chronological order of approach	
ALUMNI	Australian Catholic University Alumni Queensland University of Technology Alumni University of New England Alumni University of Southern Queensland Education Alumni
UNIONS	Independent Education Union – National, NSW and QLD branches New South Wales Teachers Federation Queensland Teachers Union
SOCIAL MEDIA	Facebook • School Inclusion Network for Educators • Beginning teachers' lounge • Australian Prep / Yr 1 / Yr 2 / Yr 3 / Yr 4 / Yr 5 / Yr 6 teachers • Secondary teachers' ideas and support community • Teachers supporting teachers • Research teams' networks Twitter • Research teams' networks
TEACHER REG.	New South Wales Education Standards Authority Queensland College of Teachers Professional Teachers Council New South Wales
PROFESSIONAL LEARNING PROVIDERS	Association of Independent Schools NSW Australian Association of Special Education Australian Council for Educational Leaders Dynamic learning Queensland Association of State School Principals

Data Analysis

Data analyses used to summarise, examine, and interpret participant responses are detailed in this section. A description of data preparation is followed by details of the different types of analyses conducted. As depicted in Table 7, the survey data were considered with reference to the research design and research questions.

- General demographics
- Self-reported knowledge
- Knowledge demonstration
- Knowledge application
- Implications of:
    - Years of experience
    - Training
    - Speech pathology support

Data preparation. Questionnaire data were exported from Survey Monkey into Microsoft Excel where each participant was allocated a simple identification number for future reference and cross checking. A total of 462 responses were exported from Survey Monkey. Thirty-one responses were ineligible as these respondents were not currently teaching in QLD (or NSW) and were removed from the data set. Another 92 were eliminated as only demographic questions were completed, which were not useful in responding to the research questions. A further 42 responses were removed as the scenario questions were incomplete. These data were essential to investigate participants' applied knowledge of learner characteristics of DLD and appropriate adjustments. Finally, 14 more response

series were removed as the question relevant to knowledge of educational impacts was incomplete. At this point 283 participants remained, however, only 21 of these were from NSW. As this number was insufficient to make comparisons and draw quality conclusions, these too were removed and are reported separately in Appendix B. The final data set reported in this thesis included 262 QLD participants with data that could be analysed in line with the research questions.

Analyses conducted. Analyses were conducted with the data from all 262 participants. As most data were obtained from closed questions with categorical responses, quantitative analyses were conducted using the Statistical Package for the Social Science (SPSS) version 25. Qualitative analysis was used for the single open-ended question that asked participants to describe the common characteristics of students with DLD.

In the quantitative analysis, SPSS was used to calculate descriptive statistics to give an overview of participant responses to demographic questions, self-reported knowledge questions, as well as knowledge demonstration and knowledge application tasks (Creswell, 2014; Fink, 2012; Fowler Jr, 2013). Participant self-reported knowledge, gathered using a five-point Likert like scale, are technically ordinal data. However, it is an established practice in social sciences research to treat these data as continuous when a scale of five or more points is used and the pattern of data approximates normal distribution (Sullivan & Artino Jr, 2013). As such, parametric analyses appropriate for continuous data have been applied for analyses with the self-reported knowledge. Frequencies of participant responses were calculated for all questions, where appropriate these were categorised according to accuracy. Mean and standard deviation were calculated for self-reported data, with paired samples t-tests were used to compare the different self-reported knowledge

item pairs. The knowledge application (scenario) questions involved frequency calculations related to the accurate identification of the primary source of difficulty for the student, as well as selection of the most helpful adjustments. Whether they accurately identified the primary source of impact or not, all participants' adjustment selections were examined to consider whether accurate identification was necessary to select appropriate adjustments. For research question three, participants' self-rated knowledge and knowledge of characteristics of DLD (compared to SSD) were compared based on years of experience, type of training and type of speech pathology support groups. As there were more than two groups to be compared in each analysis, an analysis of variance (ANOVA) was used. Where necessary, post hoc pairwise comparisons, with Bonferroni adjustment for multiple comparisons, were used to examine statistically significant differences between groups.

In the qualitative analysis for the single open-ended question, the short text responses were coded and analysed using inductive content analysis (Berg, 2001) to identify categories of responses arising from the data (Graham et al., 2015). Two coders, both speech pathologists with knowledge of DLD and experience working with teachers, engaged in training and conversation to understand and trial the code. The coders independently rated 20% of the short text responses, with an aim to achieve a minimum of 80% consistency in coding (Allen, 2017). This minimum of 80% agreement represents an acceptable level of inter-rater reliability (Allen, 2017). This level of agreement was not reached in the initial attempt. The coding schema was revised to address ambiguities, and a second independent coding process using an additional 20% of the responses was implemented. On this occasion, an accuracy rate of 93% was achieved.

Chapter 5: Results

The results obtained from the questionnaire will be outlined in this chapter in alignment with the research questions. Each domain of teacher knowledge investigated will be discussed in a separate section and linked to the research questions, which were:

1. What do teachers know about the (i) learner characteristics and (ii) educational impacts of Developmental Language Disorder (DLD)?
2. Are teachers able to (i) accurately interpret learner characteristics, and (ii) identify appropriate adjustments to enable access to the curriculum for students with DLD?
3. Are years of experience, training and speech pathology assistance associated with teacher knowledge of learner characteristics, educational impacts, and appropriate adjustments for students with DLD?

The chapter commences with a summary of participant demographics, followed by participants' knowledge of the learner characteristics of students with DLD, as well as their knowledge of the educational impacts of DLD. This is followed by results from the scenario questions, which examined participants' ability to interpret student characteristics and select appropriate adjustments. Finally, the influence of participants' teaching experience, training and speech pathology support is considered.

Participant demographics

The final sample comprised 262 teachers of which 177 were primary school teachers and 85 were secondary school teachers. Overall, there were 233 female respondents, 28 male, and 1 participant who identified with an alternate gender

descriptor. While this sample does not reflect the intended sample size or distribution, the number of responses is sufficient to investigate the research questions. A small summary of data from NSW teachers is summarised in Appendix B.

Employment, roles, and experience. Respondents working in Queensland state schools made up the greatest proportion of the sample (88.2%), with lower representation from Catholic (6.1%) and Independent (5.7%) school sectors. The questionnaire yielded responses from both primary teachers (67.6%) and secondary teachers (32.4%), with representation from a range of role holders. This range included classroom teachers (55.3%), special education teachers (28.6%), learning support teachers (9.2%), specialist advisory teachers (5.3%), and relief/supply teachers (1.9%). Participants also represented a wide range of experience in the profession. Of the total sample, 3.4% had 0-2 years' experience, 9.5% had 3-5 years' experience, 17.9% had 6-10 years' experience, and 69.1% had more than 10 years of teaching experience. More than half of this latter group had more than 20 years' service. Overall, this sample provides perspectives from teachers with a range of experience, across several different roles, working in primary and secondary contexts, and with all sectors of education represented to some degree.

Highest Qualification. The highest level of qualification varied among participants. Most reported a Bachelor of Education to be their highest qualification (51.1%). A Graduate Diploma of Education was completed by 22.9%, while 16.8% held a Master of Teaching (which recently replaced the Graduate Diploma of Education in Australia). A small number of participants (3.0%) possessed a Diploma of Education, all of whom reported greater than 20 years' experience. Several participants indicated additional study beyond their original teaching qualification.

A Graduate Certificate in a specialised area was reported by 3.1% of respondents and a Master of Education reported by 5% of participants. Participants were also asked to indicate qualifications in fields other than education. Of note was one participant who reported three additional qualifications, including a Bachelor degree in Speech Pathology, a Master of Teaching, and a Graduate Diploma in Guidance and Counselling. Another participant had completed a Master of Applied Linguistics, as well as a Master of Teaching.

Beliefs and experience with DLD. Beliefs as to who held the primary responsibility for access, engagement, and participation in the curriculum for students with DLD was investigated, whether participants believed they had taught a student with DLD or not. Most participants (76.7%) believed that classroom teachers primarily held this responsibility. A much smaller number of participants indicated that this responsibility belonged to a speech pathologist or other professional (7.6%), learning support teacher (5.3%), principal or leadership team (4.6%), or a specialist advisory teacher (2.3%). Of the 262 participants, 230 (87.8%) indicated that they believed they had taught a student with DLD, whether the student was formally diagnosed or not. These 230 participants then estimated the frequency with which they believed they had taught a student with DLD. Approximately 161 (70%) felt this had occurred either most or every year they had been teaching.

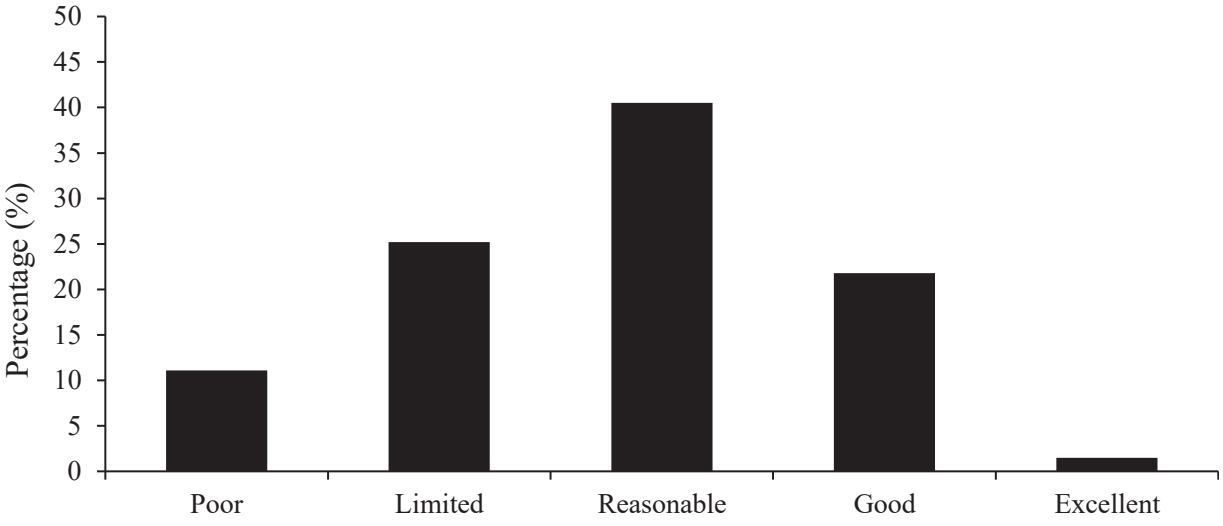
RQ1 Part (i) Learner Characteristics of Developmental Language Disorder

Self-reported knowledge. Teachers' ability to identify the presenting characteristics of students with DLD was assessed in three ways. First, all participants were asked to self-rate their ability to identify students with DLD, using a five-point scale (1 = poor, 2= limited, 3 = reasonable, 4= good, 5 = excellent). The

mean response for all respondents was 2.97 (±0.96), just below reasonable. Figure 6 illustrates the spread of responses provided.

Figure 6

Participant Self-rated Ability to Identify Students with DLD (n=262)



These data illustrate that most teachers felt they had reasonable skills (n=106, 40.5%) in identifying students with DLD. Fifty-seven participants (21.8%) rated their ability as good, and only four participants (1.5%) rated their ability as excellent. Overall, the pattern of responses is slightly skewed toward the poor to reasonable end of the scale with a greater proportion of participants describing their skills with these descriptors, rather than reasonable to excellent.

Knowledge demonstration. Participants were provided with a list of 10 characteristics commonly displayed by students with communication difficulties in the classroom. They were then asked to identify whether each listed characteristic was typical of difficulty with speech or language, both or neither. Participants could also select unsure. The task was designed to determine if participants could differentiate between the characteristics of language difficulties compared to

characteristics of speech difficulties. Six of the 10 listed characteristics were language specific difficulties typical of DLD, three characteristics were speech specific difficulties, and one characteristic was common to difficulties with both speech and language. The spread of participant responses to these characteristics are presented in Table 14, with correct responses highlighted in grey. Italicised are the responses for which most participants responded correctly. Bolded are the responses for which most participants responded incorrectly.

Table 14

Participant Knowledge of Characteristics of Developmental Language Disorder as Compared to Speech Sound Disorder (correct responses highlighted in grey, correct responses by most participants italicised, incorrect responses by most participants bolded)

	Main source of difficulty				
	Speech	**Language**	**Both**	**Neither**	**Unsure**
Difficulty with:	n (%)	n (%)	n (%)	n (%)	n (%)
Enunciating clearly	*158 (60.3)*	4 (1.5)	95 (36.3)	1 (0.4)	4 (1.5)
Producing sounds correctly	*147 (56.1)*	3 (1.1)	108 (41.2)	1 (0.4)	3 (1.1)
Being intelligible to others	56 (21.4)	3 (1.1)	**192 (73.3)**	2 (0.8)	9 (3.4)
Understanding grammar (e.g. tense)	0 (0.0)	*150 (57.3)*	105 (40.1)	2 (0.8)	5 (1.9)
Following directions	2 (0.8)	*144 (55.0)*	104 (39.7)	8 (3.1)	4 (1.5)
Retelling an event/story in order	8 (3.1)	109 (41.6)	**139 (53.1)**	2 (0.8)	4 (1.5)
Using sophisticated vocabulary	3 (1.1)	95 (36.5)	**157 (59.9)**	4 (1.5)	3 (1.1)
Learning & understanding new words	6 (2.3)	94 (35.9)	**158 (60.3)**	1 (0.4)	3 (1.1)
Using complex sentences	2 (0.8)	88 (33.6)	**164 (62.6)**	2 (0.8)	6 (2.3)
Participating in conversations	17 (6.5)	10 (3.8)	*231 (88.2)*	0 (0.0)	4 (1.5)

In only five characteristics did a majority of participants correctly identify the source of difficulty: enunciating clearly (speech), producing sounds correctly

(speech), understanding grammar (language), following directions (language), and participating in conversations (both speech and language). These five characteristics are italicised in Table 14. In the remaining five characteristics, the majority of participants incorrectly selected both (speech and language) as the main source of the difficulty. These five characteristics are bolded in Table 14. A small number of participants incorrectly selected neither for each characteristic, while a similarly small number of participants were unsure of the main source of difficulty.

A key characteristic of DLD, outlined in Chapter 2, is the persistent nature of the disorder and the fact that it cannot be "cured" through remediation (Bishop et al., 2017). Participants' knowledge of this characteristic was examined by a question that asked their thoughts on the longevity or prognosis of DLD. The question asked if the language skills of students with DLD would:

- catch up and match peers' language skills - if given time
- catch up and match peers' language skills - if provided with language intervention/therapy
- never catch up and match peers' language skills

Only 43 participants (16.4%) demonstrated an accurate understanding that DLD continues to exist throughout the life course and that students' language skills would therefore never "catch up and match" those of their peers. Most participants (n=214, 81.7%) believed that the language skills of students with DLD would resolve if they received language intervention, while a very small proportion (n=5, 1.9%) felt that students with DLD just needed time for their language skills to catch up.

Description of common learning characteristics of DLD. Next, participants were asked to provide an open-ended response to describe the common learning

characteristics of students with DLD. Participant responses were coded against seven categories that emerged from the data using inductive content analysis (Table 15).

Table 15

Coding Categories and Participant Responses when Describing Common Learning Characteristics of Students with DLD

Code	Descriptor	N (%)
0	**I don't know/unsure**	13 (5.0)
1	**Correct description** – participant described common learning characteristics of students with DLD and highlighted the core component of spoken language difficulties	153 (58.4)
2	**Partially correct** – participant described common learning characteristics of students with DLD *but did not* highlight the core component of spoken language difficulties; learning characteristics could apply to other developmental disorders	39 (14.9)
3	**Partially correct** – participant described common learning characteristics of students with DLD *but* also described learning characteristics of other speech, language and communication needs (SLCN) such as articulation and stuttering	39 (14.9)
4	**Partially correct** – participant described common learning characteristics of students with DLD *but* also described other disorders or unrelated learning needs	12 (4.6)
5	**Incorrect** – participant did not describe any common learning characteristics of students with DLD	4 (1.5)
6	**No response**	2 (0.8)

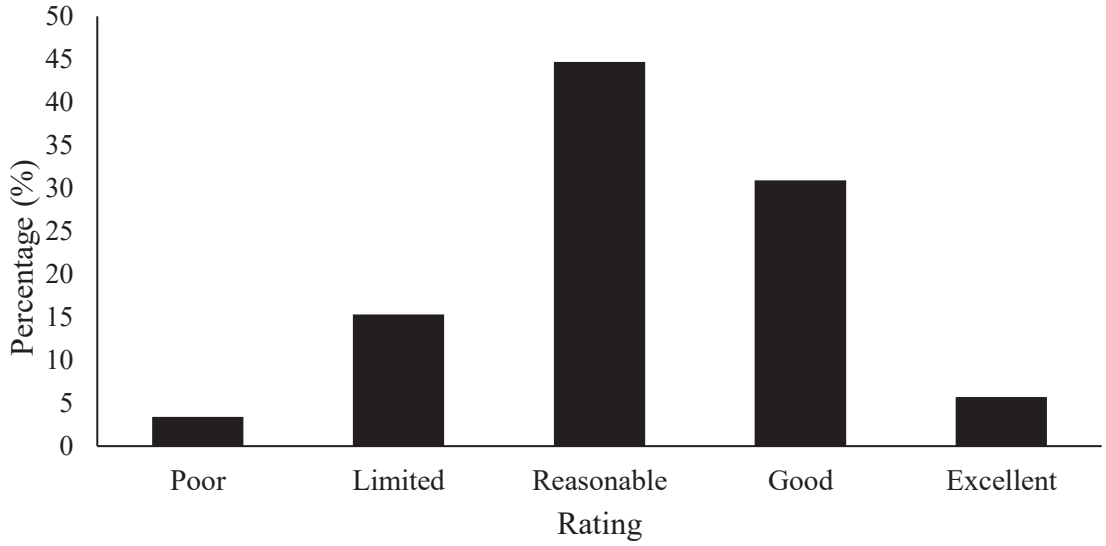
Most participants (n=153, 58.4%) provided responses that were correct (Code 1, Table 15), in that they could detail at least one characteristic that was common to students with DLD and highlighted the oral language nature of the disorder (e.g., possible difference/delays in expressive and receptive language compared to peers affecting literacy, other academic progress, social skills etc). Just over one third (n=90, 34.4%) of responses were partially correct. These responses included typical learning characteristics of students with DLD, but either did not clearly identify the oral language component (e.g., avoidance, enjoys learning on the laptop, easily distracted, slow execution), or showed confusion with other difficulties or disorders (e.g., speech difficulties, auditory processing issues, poor fine and gross motor skills, and inability to retain information). Thirteen participants (5%) stated they did not know or were unsure. One of these participants further commented that they had searched on Google to find out. Two participants did not answer the question, and four participants provided responses that were wholly incorrect (e.g., sensory processing difficulties or problems generating speech).

RQ1 Part (ii) Educational Impacts of DLD

Self-reported knowledge. Participants' knowledge of educational impacts for students with DLD was examined in two ways: first, through a self-reported knowledge question, followed by a multiple-choice knowledge demonstration task. First, participants were asked to rate their ability to recognise the educational impacts of DLD on a five-point scale (1 = poor, 2= limited, 3 = reasonable, 4= good, 5 = excellent). The mean response was 3.2 (±0.89), just above reasonable. Figure 7 illustrates the spread of responses provided.

Figure 7

Self-rated Ability to Identify Educational Impacts of DLD (n=262)



Four out of five participants (n=213, 81.3%) felt their skills in identifying the educational impacts of DLD were reasonable or better. Of these participants, 15 (5.7%) rated their skills as excellent. The remaining participants (n=49, 18.7%) rated their abilities as poor/limited. Of these participants, 9 (3.4%) rated their skills as poor. The pattern of responses shows a skew to the good/excellent end of the scale, which contrasts with participants' self-reported ability to identify DLD. Statistical comparison indicated that self-rated ability in recognising the educational impact of DLD (3.20 ± 0.89) was significantly ($t(261) = -9.88$, $p < 0.001$) higher than participants' self-rated ability to identify students with DLD (2.77 ± 0.96). Results indicate that participants felt more able to identify the educational impact of DLD (Figure 7), as opposed to identify students with DLD (Figure 6).

Knowledge demonstration. Participants were presented with a matrix to indicate which common classroom activities DLD would likely impact. Of the 13

options presented, eight were language-based tasks and therefore impacted by DLD. Five contrasting low-language tasks were included. These tasks inherently involve supportive visual information or concrete materials, which lessen the load on language skills. For each item, participants indicated whether DLD would impact on a students' engagement in the task with a yes, no, or unsure. Items are grouped in order of response in Table 16 and correct responses are highlighted in grey. In the survey, however, items were presented in alphabetical order and not grouped.

Table 16

Knowledge of Classroom Activities that are Likely Impacted by DLD (n=262; correct responses highlighted in grey, correct responses by majority of participants italicised, incorrect responses by significant proportion of participants bolded)

	Which of the following activities would DLD likely impact?	**YES n (%)**	**NO n (%)**	**UNSURE n (%)**
Language-based tasks	Following instructions	*243 (92.7)*	8 (3.1)	11 (4.2)
	Interacting with peers and staff	*245 (93.5)*	9 (3.4)	8(3.1)
	Participating in class discussions	*251 (95.8)*	7 (2.7)	4 (1.5)
	Reading	*251 (95.8)*	7 (2.7)	4 (1.5)
	Spelling	*245 (93.5)*	8 (3.1)	9 (3.4)
	Taking a test	*247 (94.3)*	7 (2.7)	8 (3.1)
	Understanding curriculum content	*245 (93.5)*	10 (3.8)	7 (2.7)
	Completing a written assignment or task	*249 (92.7)*	7 (2.7)	6 (2.3)
Low-language tasks	Interpreting maps/diagrams	**166 (63.4)**	52 (19.8)	44 (16.8)
	Learning number facts	**118 (45.0)**	85 (32.4)	59 (22.5)
	Lining up for class	78 (29.8)	141 (53.8)	43 (16.4)
	Managing/operating ICTs (e.g., iPad)	**116 (44.3)**	107 (40.8)	39 (14.9)
	Handwriting	**118 (45.5)**	97 (37.0)	47 (17.9)

Over 90% of participants correctly identified the eight language-based tasks that would pose a challenge to students with DLD (Table 16, italicised). Only a small proportion of participants were unsure or incorrect in relation to the impact of these tasks. Of note, however, were the responses to the five low-language tasks (Table 16). A considerable proportion of participants still felt that DLD would impact a students' engagement with these five tasks (Table 16, bolded). Almost two-thirds of participants thought DLD would impact students' ability to interpret maps and diagrams, and almost half thought that DLD would affect their ability to learn number facts, manage and operate ICTs, and that it would impact their handwriting. More than a quarter thought that DLD would impact students' ability to line up for class. There is also a greater trend towards the unsure option across these low-language tasks, compared to the language-based tasks.

RQ 2. Identification, Knowledge of and Ability to Apply Appropriate Adjustments

Teachers' ability to identify and interpret characteristics of DLD, and their knowledge of appropriate adjustments were investigated in three ways. First, participants were asked to rate their knowledge of (i) the language demands in their own teaching, and (ii) their ability to use adjustments to support students with DLD. Participants were then provided with a set of three scenarios and asked to match the characteristics described in each scenario with what they believed to be the mostly likely source of difficulty. Finally, participants were asked to apply their knowledge by selecting four adjustments – from a list of 12 options – that they believed were the most helpful for the students described in each of the three scenarios.

Self-reported knowledge. Using a five-point scale (1 = poor, 2 = limited, 3 = reasonable, 4 = good, 5 = excellent), participants (n=262) were asked to rate their ability to:

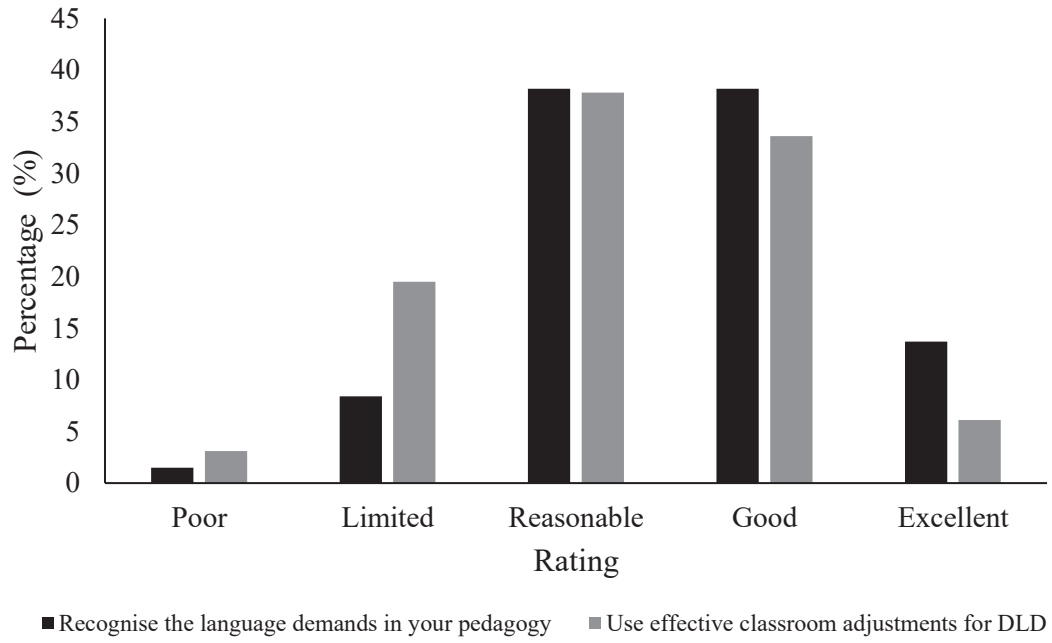
1. Recognise the language demands in their pedagogy
2. Use effective classroom adjustments for DLD

These domains are connected in that it is necessary for teachers to recognise the language demands in their teaching in order to make effective reasonable adjustments. The mean response to this item was 3.5 (±0.88), midway between reasonable and good. By contrast, the mean response to the item asking participants to rate their ability to use effective classroom adjustments for DLD was 3.2 (±0.92), or just above reasonable. The mean response for identifying the language demands of pedagogy was significantly higher than the mean response for the use effective adjustments, ($t(261) = 7.33$, $p < 0.001$). The spread of responses to these items is shown in Figure 8.

Participants felt most confident recognising the language demands in their pedagogy, with 236 participants (90.1%) responding in the reasonable, good, or excellent categories. Only 26 participants (9.9%) rated their skills as limited or poor. Fewer participants felt capable of using adjustments with 202 participants (77.5%) rating their skills as reasonable, good or excellent. The remaining 60 participants (22.6%) rated their ability to use adjustments that are appropriate to support students with DLD as limited or poor.

Figure 8

Self-rated Ability to Recognise Language Demands in Teaching and Ability to Use Appropriate Adjustments to Support DLD (n=262)



Knowledge application – scenario identification. The second task attempted to measure participants' ability to correctly interpret students' presenting characteristics. Participants were asked to apply their knowledge of learner characteristics through three scenario questions. Each scenario described a fictitious student and provided information about their learning, relationships and classroom engagement. Scenario 1 described a student with characteristics consistent with a Speech Sound Disorder (SSD), Scenario 2 described a student with characteristics consistent with Attention Deficit Hyperactivity Disorder (ADHD), and Scenario 3 described a student with characteristics consistent with Developmental Language Disorder (DLD). As described in Chapter 4, each scenario also made reference to

other factors, such as place of birth or characteristics that can exist alongside (or comorbid to) SSD, ADHD and DLD to ensure that the scenarios represented the complexities of real-life cases and were not too obvious to participants.

Participants were given the same 11 options across scenarios and asked to identify the most likely source for the impact described in each scenario. The options provided – in alphabetical order – were: Attention Deficit Hyperactivity Disorder, Autism Spectrum Disorder, Developmental Language Disorder, Childhood Complex Trauma, English as an Additional Language/Dialect, Developmental Language Disorder, Hearing Impairment, Intellectual Disability, learning difficulties, literacy difficulties, social/emotional difficulties, and Speech Sound Disorder. Overall, most participants were incorrect when applying their knowledge to the scenario questions. The results for each scenario are discussed in order, followed by a detailed examination of the DLD scenario.

Scenario 1: Speech Sound Disorder (SSD). Only 61 participants (23.3%) accurately identified SSD as the most likely source of difficulty in the first scenario, with a larger percentage of participants (n=138, 52.7%) selecting DLD and a smaller percentage of participants (n=32, 12.2%) selecting ADHD.

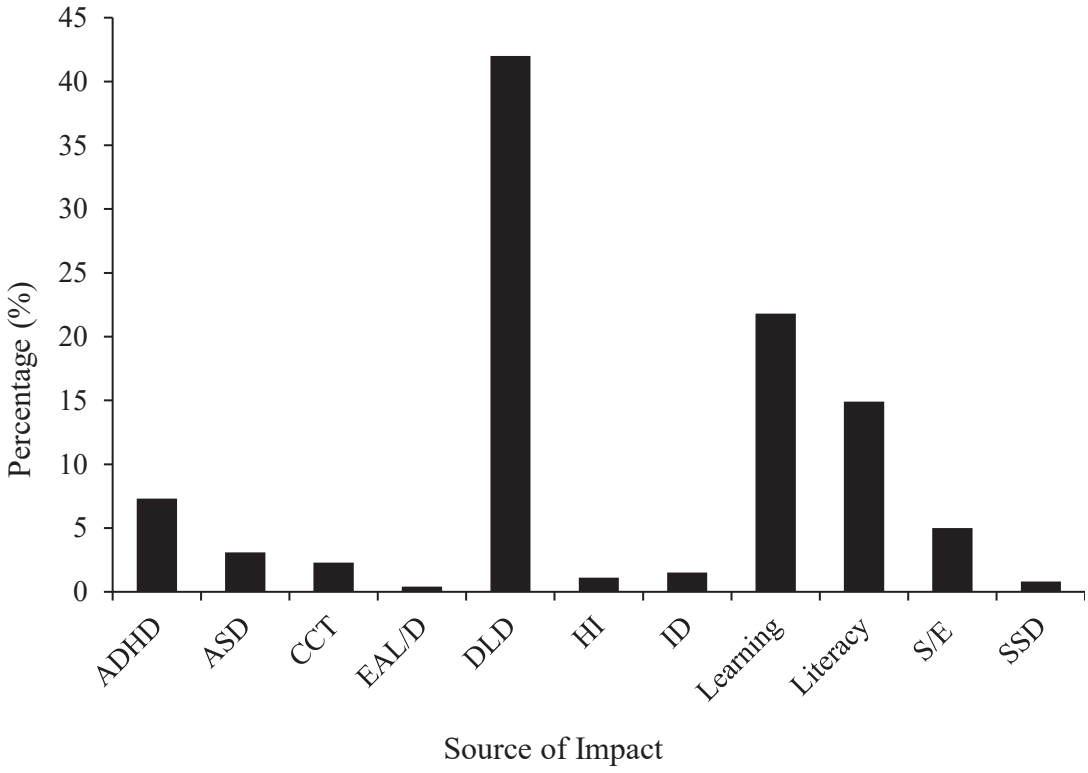
***Scenario 2: Attention Deficit Hyperactivity Disorder (ADHD*).** Only 17 participants (6.9%) accurately identified ADHD as the most likely source of impact on learning for the second scenario. The three most common responses were English as an Additional Language/Dialect (EAL/D, n=160, 61.1%), learning difficulties (n=24, 9.3%) and Childhood Complex Trauma (8.0%).

Scenario 3: Developmental Language Disorder (DLD). Of the three scenarios, the DLD scenario resulted in the most accurate identification with 110

participants (42.0%) correctly identifying DLD as the most likely source of impact. Despite this, more than half (n=152, 58.0%) of participants did not correctly identify DLD. Responses were spread across all 11 options (Figure 9) with learning difficulties (n=57, 21.8%) or literacy difficulties (n= 39, 14.9%) selected as the most likely source of impact on learning.

Figure 9

Participant Selection of Most Likely Source of Difficulty for Scenario 3 - DLD (n=262)



Key: ADHD: Attention Deficit Hyperactivity Disorder, ASD: Autism Spectrum Disorder, CCT: Childhood Complex Trauma, EAL/D: English as an Additional Language/Dialect, DLD: Developmental Language Disorder, HI: Hearing Impairment, ID: Intellectual Disability, Learning: Learning difficulties, Literacy: Literacy difficulties, S/E: Social/emotional difficulties, SSD: Speech Sound Disorder

Additional investigation was completed with the 110 participants who correctly identified DLD as the primary source of impact on learning in Scenario 3. Further analysis of these data indicated that five participants provided a blanket response of

DLD to all three scenarios. Responses to other questions by these five participants were examined to test for bias across the dataset, however, in consultation with the supervisory team it was deemed appropriate to include these five respondents in analyses.

Seventy-one of the 110 participants (64.5%) who correctly identified the DLD scenario were incorrect on the two other scenarios. Another 37 participants (33.6%) correctly identified the main source of impact in the DLD scenario plus one other scenario. Only two of the 110 participants (1.8%) correctly identified the most likely source of impact across all three scenarios.

Knowledge application – adjustment selection. The third measure of teacher knowledge of appropriate adjustments asked participants to apply their knowledge by selecting adjustments for the students described in each of the three scenarios. Participants (n=262) were provided with the most likely source of impact that they had chosen in the previous step (SSD, ADHD or DLD) and asked to choose the four most appropriate adjustments from a list of 12 possible adjustments (Table 17).

The 12 adjustment options were consistent across all three scenarios. As described in Chapter 4, options such as extra teacher aide time, 1:1 targeted intervention, and reduced curriculum expectations, were included to ensure that the correct adjustment options were not too obvious to participants. Table 17 outlines the four adjustments that were deemed most helpful from the 12 options.

Table 17

Adjustment Options Provided to Participants with the Most Helpful Adjustments for Each Scenario Indicated

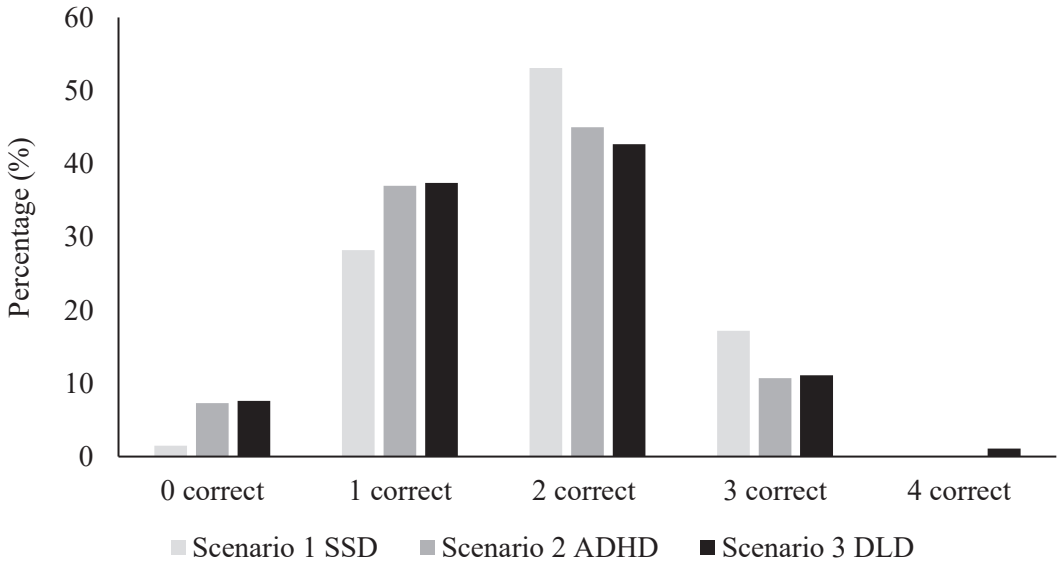
Adjustments	Scenario 1 SSD	Scenario 2 ADHD	Scenario 3 DLD
Ask student to show what they mean (e.g. act out, gesture, draw)	✓		✓
Behaviour plan		✓	
Cue attention to important information		✓	
Demonstrate learning through multiple modes (other than speaking/writing)	✓	✓	✓
Explicit (oral) vocabulary teaching			✓
Extra time to answer questions or share thinking	✓		✓
Monitor phonics and spelling development	✓		
Reduced curriculum expectations			
Reiterate key points		✓	
Social skills sessions			
Speech and/or language therapy (1:1 targeted intervention)			
1:1 teacher aide time			

Figure 10 shows the distribution of accurate adjustment selection across the three scenarios for all participants (n=262), regardless of whether they identified the most likely source of impact (SSD, ADHD, or DLD). The DLD scenario was the only scenario in which participants (n=3, 1.1%) successfully identified all four most helpful adjustments. Generally, there was a similar pattern of responses across scenarios, with most participants selecting only one or two of the most helpful adjustments for each. Fewer participants were successful in choosing three of the four most helpful adjustments (Scenario 1 SSD – n=45, 17.2%; Scenario 2 ADHD n=28, 10.7% and Scenario 3 DLD n=29, 11.1%). Some participants were not successful in selecting any of those four adjustments (Scenario 1 SSD – n=4, 1.5%, Scenario 2 ADHD

– 7.3%, and Scenario 3 DLD n=20, 7.6%). The following section unpacks participants' selection of appropriate adjustments for each scenario in turn.

Figure 10

Accuracy Selecting Most Helpful Adjustments for each Scenario (n=262)



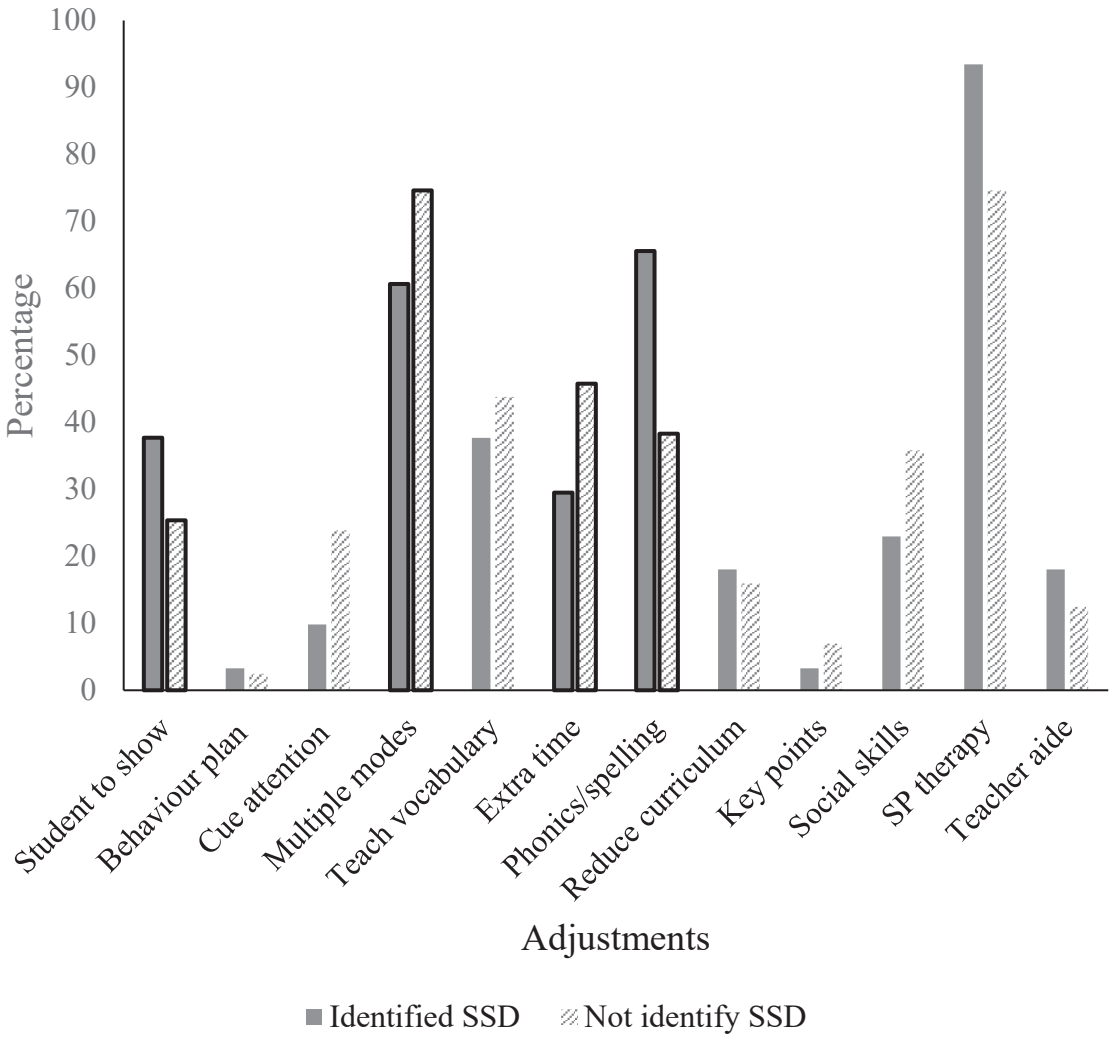
Scenario 1 – Speech Sound Disorder (SSD). This scenario described a student in Year 1 and emphasised the characteristics of Speech Sound Disorder (SSD). Of the 262 participants, 61 (23.3%) accurately identified SSD as the main source of impact in Scenario 1. Figure 11 illustrates adjustment selection made by participants who accurately identified SSD (grey bars) and those who did not identify SSD (inaccurate; hatched bars), with the four most helpful adjustments highlighted by bars with thick black borders. Those who accurately identified SSD (n=61, 23% of total sample) commonly selected three of the four most helpful adjustments: asking the student to show what they mean (23 of 61, 37.7%), demonstrating learning through multiple modes (37 of 61, 60.7%) and monitoring phonics and spelling development (40 of 61, 65.6%). Giving the student extra time to answer was the

fourth most helpful adjustment (18 of the 61, 29.5%). This was selected less frequently than speech/language therapy and explicit (oral) vocabulary teaching.

Those who were inaccurate in identifying SSD (n=201, 76.7% of total sample), commonly selected two of the four most helpful adjustments: demonstrating learning through multiple modes (150 of 201, 74.6%) and, unlike the participants who accurately identified SSD, giving the student extra time to answer (92 of 201, 45.8%). Across both groups a comparatively large proportion of participants selected speech/language therapy as a most helpful adjustment (identify SSD 57 of 61, 93.5%; not identify SSD 150 of 201, 74.6%). Both groups also frequently selected explicit (oral) vocabulary instruction (identified SSD 23 of 61, 37.7%; not identify SSD 88 of 201, 43.8%).

Figure 11

Comparison of Adjustment Selection by Participants - Accurate Identification of SSD (n=61) and Inaccurate Identification of SSD (n=201).



Note: Most helpful adjustments highlighted by bars with thick black borders.

Key: *Student to show:* Ask the student to show what they mean (e.g. act out, gesture, draw; *Behaviour plan*; *Cue attention:* Cue attention into the important information; *Multiple modes:* Demonstrate learning through multiple modes (other than speaking/writing); *Teach vocabulary*: Explicit (oral) vocabulary teaching; *Extra time*: Extra time to answer questions or share thinking; *Phonics/spelling*: Monitor phonics and spelling development; *Reduce curriculum*: Reduced curriculum expectations; *Key points*: Reiterate key points; *Social skills:* Social skills sessions; SP therapy: Speech and/or language therapy (1:1 targeted intervention); *Teacher aide*: 1:1 teacher aide time

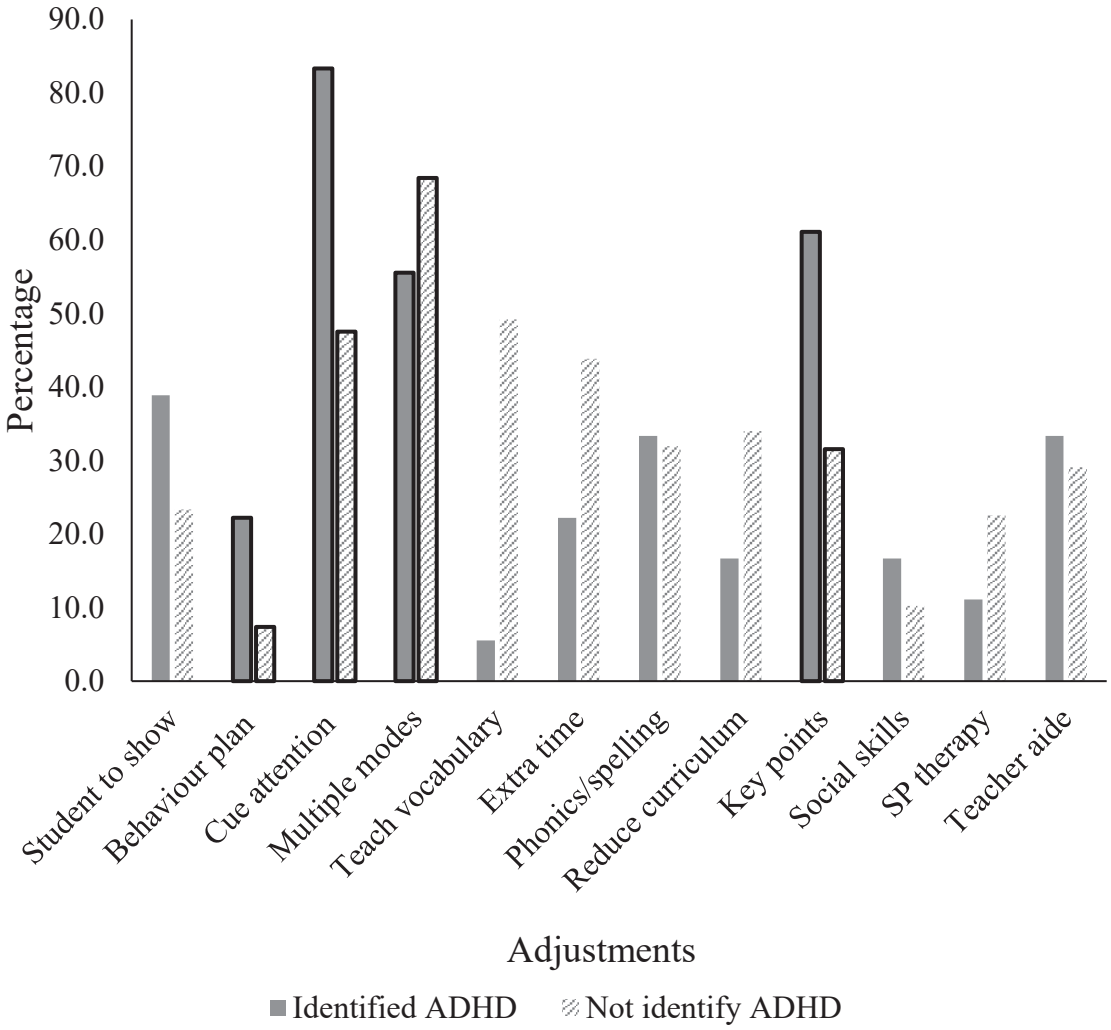
Scenario 2 – Attention Deficit Hyperactivity Disorder (ADHD). This scenario described a student with Attention Deficit Hyperactivity Disorder (ADHD)

and was correctly identified by 18 participants. Figure 12 illustrates adjustment selection made by participants who accurately identified ADHD (grey bars) and those who did not accurately identify ADHD (hatched bars), with the four most helpful adjustments highlighted (thickened borders). Those who accurately identified ADHD (n=18) commonly selected three of the four most helpful adjustments: cueing attention to important information (15 out of 18, 83.3%), reiterating key points (11 out of 18, 61.1%), and demonstrating learning through multiple modes (10 out of 18, 55.5%). Utilising a behaviour plan (4 out of 18, 22.2%), the final most helpful adjustment, was selected less frequently than asking the student to show what they mean (7 out of 18, 38.9%), monitoring phonics and spelling development (6 out of 18, 33.3%), and utilising a teacher aide for individual support (6 out of 18, 33.3%).

Those who were inaccurate in identifying ADHD (n=244), commonly selected two of the four most helpful adjustments: demonstrating learning through multiple modes (167 out of 244, 68.4%) and cueing attention to important information (116 out of 244, 47.5%). This group of participants more frequently selected explicit (oral) vocabulary instruction (120 out of 244, 49.2%), extra time to answer questions and share thinking (107 out of 244, 43.9%), and reduced curriculum expectations (83 out of 244, 34.0%) than the remaining two most helpful adjustments, reiterating key points (77 out of 244, 31.5%) and utilising a behaviour plan (18 out of 244, 75.4%).

Figure 12

Comparison of Adjustment Selection by Participants - Accurate identification of ADHD (n=18) and Inaccurate Identification of ADHD (n=244).



Note: Most helpful adjustments highlighted by bars with thick black borders.

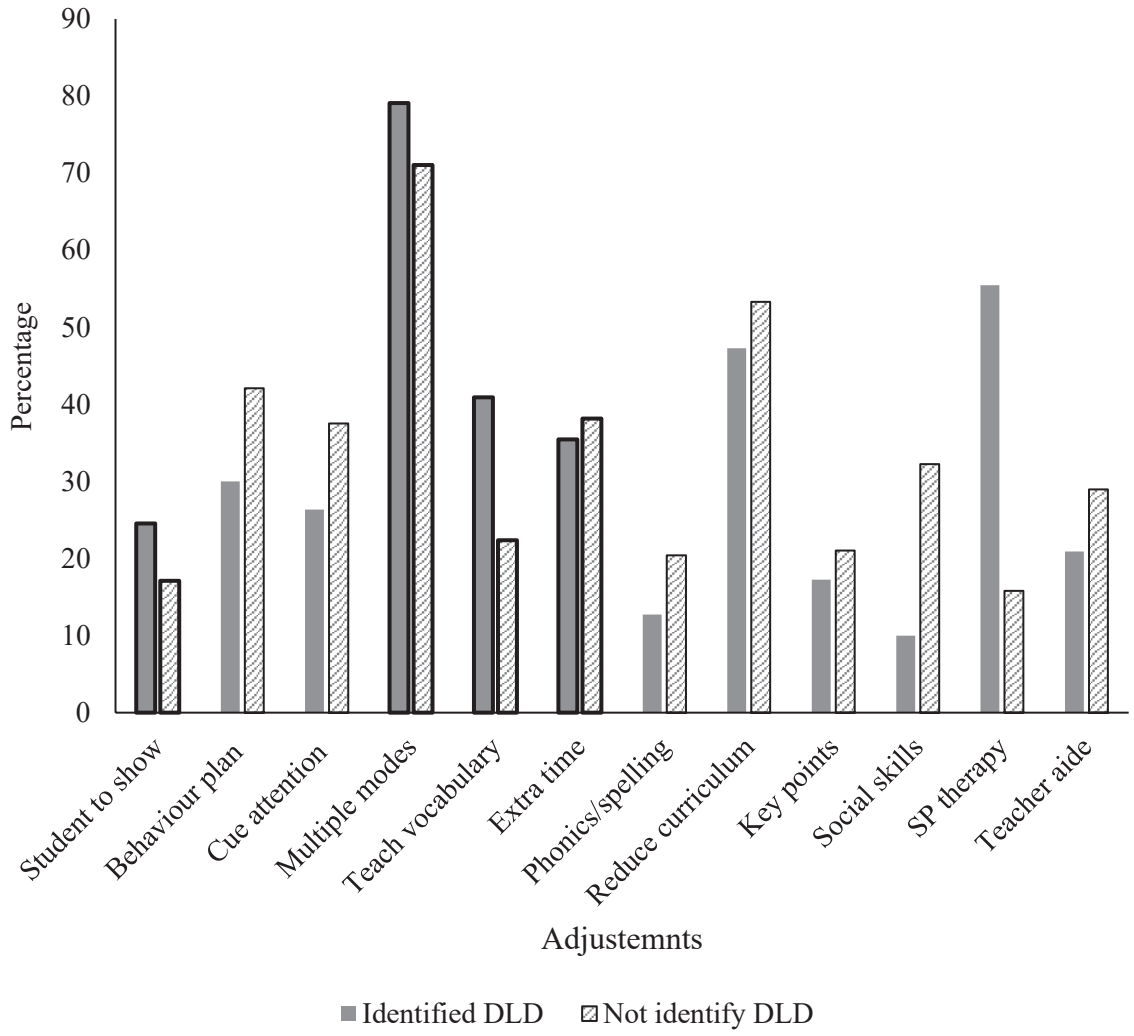
Key: *Student to show:* Ask the student to show what they mean (e.g. act out, gesture, draw; *Behaviour plan*; *Cue attention:* Cue attention into the important information; *Multiple modes:* Demonstrate learning through multiple modes (other than speaking/writing); *Teach vocabulary*: Explicit (oral) vocabulary teaching; *Extra time*: Extra time to answer questions or share thinking; *Phonics/spelling*: Monitor phonics and spelling development; *Reduce curriculum*: Reduced curriculum expectations; *Key points*: Reiterate key points; *Social skills:* Social skills sessions; SP therapy: Speech and/or language therapy (1:1 targeted intervention); *Teacher aide*: 1:1 teacher aide time

Scenario 3 – Developmental Language Disorder. This scenario described a student with Developmental Language Disorder (DLD). Figure 13 illustrates adjustment selections made by all 262 participants. Those who accurately identified DLD (n=110) are represented by solid bars and those who did not identify DLD in the scenario by the hatched bars. The four most helpful adjustments for this student are highlighted by thickened borders of the bars. Of the 110 participants who identified DLD as the primary source of difficulty in this scenario, only two (1.8%) selected all four of the most helpful adjustments. Four participants (3.6%) did not select any of the most helpful adjustments. Participants commonly selected one of the four adjustments: demonstrating learning through multiple modes (87 out of 110, 79.1%). Following this, the most frequently selected adjustments were speech/language therapy (61 out of 110, 55.5%) and reduce curriculum expectations (52 out of 110, 47.3%). Participants then selected the other most helpful adjustments: explicit (oral) vocabulary instruction (45 out of 110, 40.9%), extra time to answer questions or share thinking (39 out of 110, 35.4%), and asking the student to show what they mean (27 out of 110, 24.5%). Another common selection was a behaviour plan (33 out of 110, 30.0%).

Participants who did not accurately identify DLD (n=152), also commonly selected one of the four most helpful adjustments: demonstrating learning through multiple modes (108 out of 152, 71.1%). Other adjustments commonly selected were reduced curriculum expectations (81 out of 152, 53.3%) and behaviour plan (64 out of 152, 42.1%). The other most helpful adjustments were selected relatively infrequently: extra time to answer questions and share thinking (58 out of 152, 38.2%); explicit (oral) vocabulary instruction (34 out of 152, 22.4%); and asking the student to show what they mean (26 out of 152, 17.1%).

Figure 13

Comparison of Adjustment Selection by Participants - Accurate Identification of DLD (n=110) and Inaccurate Identification of DLD (n=152)



Note: Most helpful adjustments highlighted by bars with thick black borders.

Key: *Student to show:* Ask the student to show what they mean (e.g. act out, gesture, draw; *Behaviour plan*; *Cue attention:* Cue attention into the important information; *Multiple modes:* Demonstrate learning through multiple modes (other than speaking/writing); *Teach vocabulary*: Explicit (oral) vocabulary teaching; *Extra time*: Extra time to answer questions or share thinking; *Phonics/spelling*: Monitor phonics and spelling development; *Reduce curriculum*: Reduced curriculum expectations; *Key points*: Reiterate key points; *Social skills:* Social skills sessions; SP therapy: Speech and/or language therapy (1:1 targeted intervention); *Teacher aide*: 1:1 teacher aide time

RQ3. Influences on teacher knowledge

The final research question investigated factors that may influence teacher knowledge of the characteristics, educational impacts, and selection of adjustments for students with DLD. This section examines associations between teachers' years of experience, access to and participation in professional learning related to DLD, and whether they have received assistance from a speech pathologist.

Experience. Teachers' years of experience was organised into groups (0-5 years, 6-10 years, 11-20 years, and more than 20 years). These groups were used to compare self-rated knowledge of DLD, ability to identify the characteristics of DLD, and ability to distinguish the characteristics of DLD from those of Speech Sound Disorder (SSD). Sixty-nine percent of participants had 11 or more years of experience with an even spread across the categories of 11-20 years to over 20 years. Participants with 10 years' experience or less constituted 14.8% of the group with early career teachers (0-5 years' experience) making up 12.9%.

Analysis of variance was conducted for the four items of self-rated knowledge of DLD. The group means for each item are presented in Table 18. There was a significant difference between the four experience groups in identifying students with DLD ($F(3,258) = 4.41$, $p = .005$). Pairwise comparison indicated that the teachers with 0-5 years' experience rated their ability to identify students with DLD lower than all other experience groups ($ps < .05$). These experience groups were also used to compare teachers' ability to distinguish between the characteristics of DLD and SSD (as outlined in Table 14, earlier in the chapter).

Table 18

Comparison of Years of Experience and Self-Rated Knowledge of DLD (n=262)

	Years of Experience Mean ± SD					
Self-rated knowledge (1=poor to 5 = excellent)	**0-5 years n = 34**	**6-10 years n = 47**	**11-20 years n = 92**	**20+ years n = 89**	***F(3,258)***	***p***
Identify students with Developmental Language Disorder	2.24 ±.92	2.94 ±1.10	2.83 ±.86	2.84 ±.95	4.41	.005
Recognise the educational impact of Developmental Language Disorder	2.85 ±.74	3.17 ±.96	3.27 ±.89	3.28 ±.88	2.22	.086
Recognise the language demands in your pedagogy	3.21 ±.98	3.62 ±.87	3.59 ±.87	3.58 ±.86	1.91	.129
Use effective classroom adjustments for Developmental Language Disorder	2.82 ±.87	3.23 ±.98	3.26 ±.89	3.27 ±.94	2.22	.086

For the 10 items (six being characteristics common to DLD, three being common to SSD, and one being common to both), all four experience groups had a similar rate of accuracy (0-5 years: 46 ± 24 %, 6-10 years: 49 ± 26 %, 11-20 years: 50 ± 25 %, 20 + years: 47 ± 26 %) and were not significantly different ($F < 1$).

Training. Participants were asked to indicate the training they had received on language development, disorder, links between language and literacy, and strategies to support students with language disorder. Responses are summarised in Table 19 with rows highlighted in grey being most relevant to Research Question 3. Reports of training across the domains listed in Table 19 were variable. Noteworthy is the proportion of participants who have received no training about typical language development (n=34, 13%), the links between language and literacy (n=43, 16.4%), language disorder (n=115, 43.9%), or strategies to support students with language disorder (n=96, 36.6%).

Table 19

Experience of Professional Learning (n=262)

Training/professional learning in:	No	Yes *Initial teacher education*	Yes *Other professional learning*	Unsure
	n (%)	n (%)	n (%)	n (%)
Typical language development	34 (13.0)	47 (17.9)	92 (35.1)	89 (34.0)
Links between language and literacy	43 (16.4)	74 (28.2)	135 (51.5)	10 (3.8)
Language disorder	115 (43.9)	42 (16.0)	94 (35.9)	11 (4.2)
Strategies to support children with language disorders	96 (36.6)	35 (13.4)	115 (43.9)	16 (6.1)

Where participants had received training, the majority experienced this through additional professional learning rather than through their initial teacher education degree.

Training in language disorder and strategies to support students with DLD are highlighted in grey (Table 19), as they directly align with the research questions and were used to compare participants' self-rated knowledge with their ability to:

- identify characteristics of students with DLD,
- recognise educational impacts,
- recognise the language demands in pedagogy, and
- identify appropriate adjustments.

These analyses are presented in the subsequent sections.

Training in language disorder. Four groups of participants were determined based on their reported access to training specifically related to language disorder: (1) No training, (2) Yes – initial teacher education, (3) Yes – other professional

development, and (4) Unsure. Table 20 presents the means, standard deviations, and analysis of variance outcomes. On all self-rated knowledge items, there were significant differences between the four groups (*ps* <.001). Participants who had engaged in professional learning through additional professional development (received after completing their initial teaching education degree), rated their knowledge significantly higher in all four domains than participants with no training or with training provided through their initial teacher education. Only in identifying students with DLD did participants with initial teacher education rate their knowledge significantly higher than participants with no additional training in language disorder (p=0.03). In all other items, participants with initial teacher education were not statistically different to the no training or unsure groups.

Table 20

Comparison of Self-Rated Knowledge and Receipt of Training Specific to Language Disorder (n=262)

	Received training about Language Disorder Mean ± SD					
Self-rated knowledge	**No**	**Yes** *Initial Teacher Education*	**Yes** *Other Professional Development*	**Unsure**	***F(3,258)***	***p***
(1=poor to 5 = excellent)	**n=115**	**n=42**	**n=94**	**n=11**		
Identify students with Developmental Language Disorder	2.36 ±.94	2.79 ±.81	3.35 ±.77	2.18 ±.60	25.46	<.001
Recognise the educational impact of Developmental Language Disorder	2.88 ±.88	3.05 ±.82	3.70 ±.73	2.91 ±.54	19.11	<.001
Recognise the language demands in your pedagogy	3.32 ±.97	3.38 ±.78	3.87 ±.78	3.64 ±.50	7.79	<.001
Use effective classroom adjustments for Developmental Language Disorder	2.82 ±.86	3.05 ±.79	3.74 ±.83	3.18 ±.60	22.01	<.001

These four training in language disorder groups were also used to compare participants' ability to differentiate between characteristics of DLD and characteristics of SSD. The analysis of variance indicated a significant difference between the groups ($F(3,258) = 3.132$, $p=0.026$) (no training: 45 ± 24%, training in initial teacher education: 43 ± 25%, other professional learning: 54 ± 25%, unsure if received training: 56 ± 19%). However, the subsequent pairwise comparison with Bonferroni correction did not indicate any significant pairs that were driving the main effect.

Training in strategies to support students with DLD. Four new groups were determined based on participants' reported access to training in strategies to support students with DLD: (1) No training, (2) Yes – initial teacher education, (3) Yes – other professional development, (4) Unsure. Table 21 presents the means, standard deviations, and analysis of variance outcomes. On all self-rated knowledge items, there were significant differences between the four groups (ps <.001). Pairwise comparison indicated that these main effects were again driven by participants who had other professional learning after their teaching qualification. In all aspects of self-rated knowledge, this group of participants rated their knowledge higher than participants in the other three groups (ps<.05). Those who reported learning strategies to support students with DLD in their initial teacher education rated themselves significantly higher in identifying students with DLD when compared to those with no training (p=.006) and those who were unsure whether they received any training (p=.009). These groups of participants based on type of training were then compared with regard to their ability to distinguish the characteristics of DLD from those of SSD.

Table 21

Comparison of Participants who Received Training about Strategies to Support DLD and Self-Rated Knowledge (n=262)

	Received training about supporting students with Language Disorder Mean ± SD					
Self-rated knowledge (1=poor to 5 = excellent)	**No** n=96	**Yes** *Initial Teacher Education* n=35	**Yes** *Other Professional Development* n=115	**Unsure** n=16	***F(3,258)***	***p***
Identify students with Developmental Language Disorder	2.26 ±.92	2.80 ±.72	3.30 ±.80	2.00 ±.52	33.17	<.001
Recognise the educational impact of Developmental Language Disorder	2.90 ±.96	2.94 ±.80	3.60 ±.83	2.75 ±.68	16.28	<.001
Recognise the language demands in your pedagogy	3.35 ±.89	3.14 ±.81	3.88 ±.77	3.13 ±.96	11.81	<.001
Use effective classroom adjustments for Developmental Language Disorder	2.76 ±.82	2.97 ±.75	3.72 ±.81	2.63 ±.81	29.29	<.001

Differences across the groups were not significant ($F(3,258) = 1.49$, $p = 0.22$). Generally, the different training groups had similar accuracy in distinguishing between common characteristics of DLD and SSD (no training: 46 ± 26 %, training in initial teacher education: 43 ± 24 %, other professional learning: 52 ± 25 %, unsure if received training: 48 ± 24%).

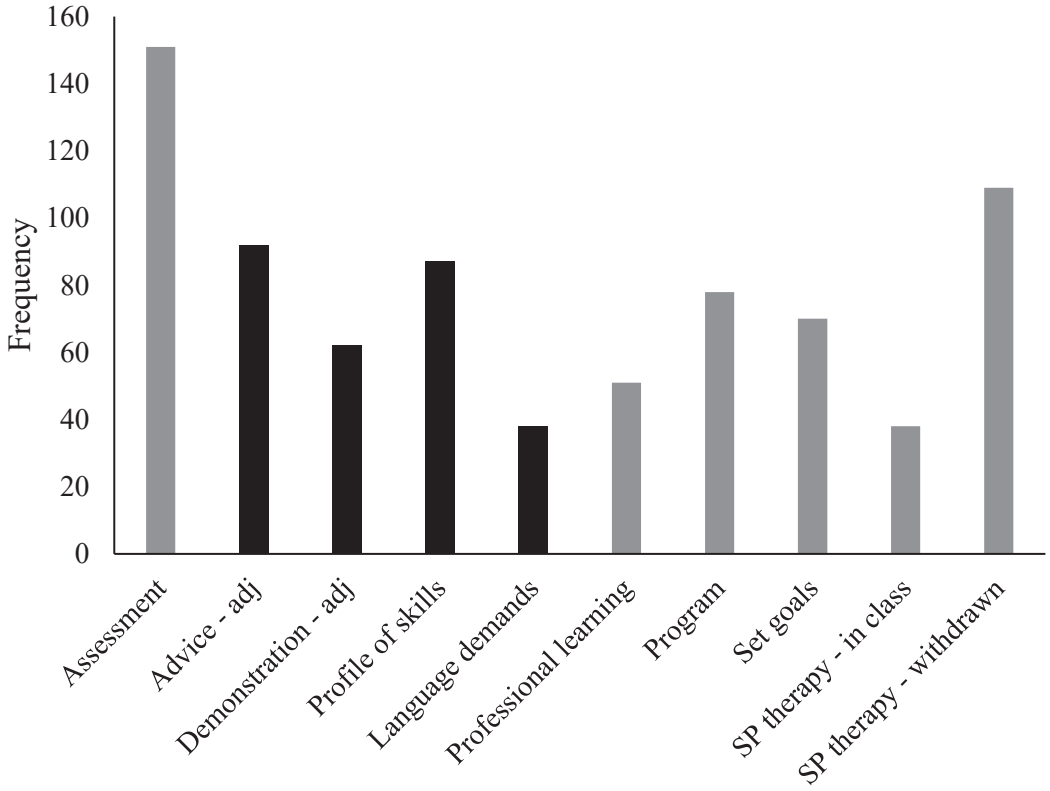
Speech Pathology Support. Lastly, the influence of speech pathology support on participant knowledge was examined. Some participants (n=32) indicated that they had never taught a student with DLD. These participants were routed past the questions related to speech pathologist support and are not included in the following analysis, leaving a total of 230 participants. Sixty-three participants (27.4%) had taught a student with DLD (either formally diagnosed or suspected) but had not

received support from a speech pathologist for these students. The majority of participants (n=167, 72.6%) had received support from a speech pathologist for a student they had taught with DLD. These participants were asked to indicate what types of supports they had received and were able to select as many as applied from the 10 options provided (Figure 14).

The most common types of support received were assessment and report of the students' language skills, and withdrawal intervention conducted by a speech pathologist. Four types of speech pathology support — (1) classroom observations and advice on appropriate adjustments/classroom strategies, (2) demonstration of adjustments/strategies, (3) detailed outline of the student's language skills/need, and (4) identification of the language demands of the curriculum/classroom — make explicit links with the knowledge and skills that are the focus of the present study. These knowledge and skills are identifying and interpreting learner characteristics, understanding educational impact, and identifying appropriate adjustments (Figure 14, highlighted by black bars). These four types of targeted speech pathology support are linked because they enhance teachers' knowledge regarding specific students' profile of language need and improve their ability to identify and implement appropriate adjustments.

Figure 14

Frequency of Types of Support Received through Engagement with a Speech Pathologist - Grey bars indicating support most closely linked to knowledge of characteristics, impacts and adjustments (n=167)



Key: *Assessment*: Assessment of language skills (with report and/or feedback); *Advice – adj*: Classroom observations and advice on appropriate adjustments/classroom strategies; *Demonstration – adj*: Demonstration of adjustments/strategies; *Profile of skills*: Detailed outline of the student's language skills/need; *Language demands:* Identification of the language demands of the curriculum/classroom; *Professional learning:* Professional learning or training (formal or informal); *Program:* Program for you/another staff member to carry out; *Set goals:* Setting language goals (e.g. IEP meeting or similar); *SP therapy – in class:* Speech pathology intervention – in the classroom; *SP therapy– withdrawn:* Speech pathology intervention – withdrawal from the classroom/outside school

The remainder of this section, these four types of speech pathology support (classroom observation and advice on classroom adjustments/strategies, demonstration of adjustments/strategies, detailed outline of students' language profile, identification of the language demands in the curriculum/classroom) were

used for comparative analysis. These four focus supports will be referred to as *targeted* speech pathology support while the other types of speech pathology support will be referred to as *general* supports.

The number and percentage of participants in each group are illustrated in Table 22. These groups of participants were compared with regard to their ability to distinguish the characteristics of DLD from those of SSD. Only those comparisons that resulted in a statistically significant difference will be outlined in the following section.

Table 22

Participant Experiences of Speech Pathology (SP) Support (n=230)

	Group	n (%)
No SP Support	Taught a student with DLD	63 (24.0)
SP Support Received	General SP support	36 (13.7)
	1 or 2 of the targeted supports	86 (32.8)
	3 or 4 of the targeted supports	45 (17.2)

Self-rated knowledge. Initially, an analysis of variance was conducted for the four types of self-rated knowledge to determine any associations with speech pathology support. Means and standard deviations are illustrated in Table 23. A significant difference was found between the groups for each type of self-rated knowledge (*ps* <.001). Pairwise comparisons illustrated that the difference was mainly driven by participants who had never received speech pathology support. Participants from the no SP support group rated themselves significantly lower to the three groups of participants who had received either of two types of speech

pathology support: (1) support to identify students with DLD (*ps*<.001), and (2) support to identify and implement effective adjustments (*ps*<.001). In recognising the educational impact of DLD and the language demands in pedagogy, the no SP support group was significantly lower than the groups who received the targeted SP support types (*ps*<.004). The general SP supports group was statistically the targeted SP support (3-4 types) in both recognising the educational impacts (*p*=.032) and in adjusting support students with DLD (*p*=.036).

Table 23

Comparison of Participants Self-Rated Knowledge based on Experience of Speech Pathology Support (n=230)

Self-Reported Knowledge	No SP Support	General SP support	Targeted SP support (1 or 2 types)	Targeted SP support (3 or 4 types)	*F*(3,226)	*p*
	N=63	N=36	N=86	N=45		
Identify students with DLD	2.19 ±0.82	2.94 ±0.75	313 ±0.79	3.36 ±0.83	23.58	<.001
Recognise educational impact of DLD	2.89 ±0.72	3.28 ±0.66	3.41 ±0.79	3.76 ±0.83	12.09	<.001
Recognise language demands in your pedagogy	3.16 ±0.92	3.50 ±0.65	3.65 ±0.89	3.89 ±0.88	7.09	<.001
Use effective classroom adjustments for DLD	2.66 ±0.94	3.28 ±0.70	3.48 ±0.81	3.78 ±0.85	20.23	<.001

Knowledge of SSD and DLD characteristics. Analysis of variance was also conducted to examine the influence of speech pathology support on participants' ability to distinguish between characteristics of DLD and SSD. This analysis revealed a significant difference between groups ($F(3,258)=2.243$, $p=0.013$). Pairwise comparison with Bonferroni correction illustrated that the no SP Support group performed significantly poorer on this task than the targeted SP support (3-4 types) group (no SP support: 42 ±25%; targeted SP support (3-4 types): 58 ±25%).

Chapter 6: Discussion

The aim of this study was to understand what Australian teachers know about Developmental Language Disorder (DLD). The examined knowledge domains included characteristics of DLD, educational impacts, and adjustments. The online survey design allowed data to be gathered to address three research questions, the results of which were reported in Chapter 5. The research questions were designed to investigate what teachers know about DLD and whether their knowledge is sufficient to: (i) correctly identify and interpret the presenting characteristics of students with DLD, and (ii) plan effective adjustments that allow these students to engage, participate and achieve at school. Factors that may enhance teacher knowledge and practice, including years of experience, exposure to training and speech pathology support, were also investigated.

The conceptual framework underpinning this study (Figure 15) proposes that deep professional knowledge is necessary for teachers to ensure access to the curriculum for students with DLD. The knowledge chain sits within an understanding of the principles of inclusive practice and includes three overlapping domains of knowledge: characteristics of students with DLD, educational impacts of DLD, and appropriate adjustments. Each domain of knowledge is one link in the chain. Like a chain, the strength lies in the inter-connectivity of the links, rather than the links themselves. It is proposed, through this conceptual framing, that understanding the characteristics of DLD supports teachers' identification and interpretation of those same characteristics. In this way knowledge of DLD informs teachers' understanding of the educational impacts of DLD and the language barriers

to be overcome. The knowledge of DLD and of educational impacts collectively forms the theoretical grounding or *know why*. This *know why* then informs the *know how* or the selection of adjustments that address the language barriers impacting students' participation and learning.

Figure 15

The Knowledge Chain: A Representation of Knowledge Domains Investigated in this Project

In the following sections the key findings of this study are outlined. It is structured according to the links of the knowledge chain. The knowledge demonstration tasks for each knowledge domain are discussed before turning to the self-report data. This allows for comparisons between participant performance and perception. The findings related to the additional factors of years of experience, training and speech pathologist support are then discussed. The chapter concludes

with suggestions to support teachers to understand and support students with DLD and meet their obligations. The chapter finishes followed by a discussion of the limitations of this study and further research opportunities.

Link 1. Knowledge of DLD

Knowledge of DLD is the first link in the knowledge chain. If teachers are not aware that DLD exists and are not familiar with some of the key language characteristics, then students with DLD are at risk of their learning needs not being recognised and addressed through adjustments. Teachers' knowledge of the characteristics of DLD was measured through self-report and knowledge demonstration tasks. Self-report data were gathered across knowledge domains and will be discussed separately, later in the chapter. The following discussion focuses on the demonstrated knowledge of the key characteristics of DLD. These included an awareness that DLD is persistent through childhood into adulthood; that DLD is distinct from Speech Sound Disorder (another type of speech, language and communication need); and an ability to recognise common characteristics of DLD in students within the classroom. Participants were also asked to demonstrate knowledge of classroom characteristics through description in an open response survey item.

Analysis of these data indicated that participants demonstrated general knowledge of speech, language, and communication needs (SLCN), but lacked knowledge specific to DLD. This outcome aligns with that of past studies in the field (Dockrell & Howell, 2015; Dockrell et al., 2017; Girolamo, 2017). In the present study, lack of participant knowledge about DLD was evident when most participants (81.7%) identified DLD as a disorder that would resolve with direct and specific intervention, rather than recognising its persistent nature (Bishop et al.,

2017; Conti-Ramsden & Durkin, 2008; Whitehouse, Line, et al., 2009). Lack of specificity in knowledge of DLD was also demonstrated when participants were unable to consistently differentiate characteristics of DLD from those of Speech Sound Disorder (SSD). On six of 10 items, participants 'hedged their bets' and responded that they felt the characteristic could be a result of both disorders, when this was true for only one of the 10 items. This, too, is consistent with previous research, most notably that of Dockrell and colleagues (2015; 2017), whose participants had difficulty differentiating between these two types of SLCN, language difficulties and speech difficulties.

In the main, participants' free text descriptions of DLD characteristics reflected both limited knowledge and lack of specificity. Only three in five participants (58.4%) were able to provide a detailed description. Within these, there was a wide range of responses outlining the language features of DLD from basic ("can't understand") to comprehensive ("slow to process information, difficulty following directions, don't always understand what you are asking and need to paraphrase or repeat information, difficulty expressing themselves, or finding the words to use, don't speak using grammatically correct sentences, limited vocabulary"). A further one in three participants (34.4%) were only partially accurate, in that they could describe at least one characteristic of DLD. These participants confused DLD with another type of communication difficulty (e.g., articulation difficulties, stuttering), another developmental disorder (e.g., ADHD, intellectual difficulties, motor difficulties) or described characteristics that were vague and did not reflect the oral language nature of the disorder (e.g. slower to learn, low confidence, task avoidant). These findings illustrate that participants are familiar with communication concerns,

in general, but do not have a detailed understanding that students with DLD can and do have ongoing, oral language-based learning needs.

If these findings are indicative of Australian teachers' knowledge of DLD, it is possible that more than 80% of teachers, believing that DLD resolves with support and intervention, will cease to explore the possibility of language difficulties impacting on learning beyond the early years of school. As a result, a large proportion of students with DLD may have their learning needs misunderstood, with the risk increasing as they progress through schooling. Compounding the issue is the lack of knowledge about the language-based nature of DLD. If the language needs of a student are not accurately recognised, a teacher is not able to consider the language barriers and make adjustments to minimise these barriers (Australian Government Department of Education and Training, 2015). Nor are they able to meet the professional standard of 'understanding the learner and how they learn' (Australian Institute for Teaching and School Leadership, 2017a).

These findings support the assertion that DLD is complex, misunderstood and, without key knowledge of the red flags (Table 1), easily missed by teachers (Bishop et al., 2017; Law et al., 2017; Lee, 2013). The concern is that generalities may lead to generalities; that misunderstandings early in the knowledge chain (Figure 15) may lead to missteps that are compounded, as a teacher travels along the path of identifying characteristics, understanding the educational impacts and language barriers related to those characteristics, and determining appropriate, matched adjustments. Without accurate identification of the language characteristics of DLD, proactive planning to address the resulting functional impacts will be limited, which leads to the long-term negative impacts evidenced in the literature by Clegg et al. (2005), Schoon et al. (2010), Whitehouse, Watt, et al. (2009).

Link 2. Knowledge of educational impacts

The knowledge chain conceptual model underpinning this study proposes that knowledge of DLD may have a flow-on effect, potentially influencing the second link in the chain: knowledge of educational impacts. Seeing and interpreting educational impacts is critical to making appropriate adjustments. Knowledge of DLD and knowledge of educational impacts combine to make the *know why* – with the flow of knowledge being bidirectional. If a teacher knows or suspects a student has DLD, they can view the educational impacts through a lens of language needs and barriers. Alternatively, if a teacher observes a set of educational impacts but is not sure of the underlying cause, knowledge of the characteristics of DLD will assist them to see if the pattern of impacts relates to language barriers.

Teachers' knowledge in this domain was measured through self-report, knowledge demonstration and knowledge application tasks. As outlined earlier, the self-report findings are discussed later in the chapter. Discussed below are the results from two tasks. The first task assessed participants' ability to use their knowledge of the characteristics of DLD to identify common school tasks that would be challenging for students in this group. The task required participants to convert theoretical knowledge of the characteristics of DLD to anticipate the practical challenges a student would face at school. The second task assessed participants' ability to interpret students' presenting characteristics and educational impacts from scenario descriptions to identify the most likely source of impact. This task required a reverse knowledge flow from the presented educational impacts to identify characteristics of DLD.

Analysis of data from these tasks indicated that very few participants were able to accurately interpret educational impacts and their relationship to DLD. For the

first task, participants were provided with 13 common school tasks and asked to identify which would likely be challenging for students with DLD (choices included yes, no, unsure). Eight of these tasks required a reasonable degree of language competence to engage with or complete, like participating in class discussions and understanding curriculum content. Thus, they were considered language-loaded tasks. The other five tasks inherently involved visual information and/or simple or minimal language demands and were, therefore, considered low-language tasks. For example, interpreting maps and diagrams requires processing of primarily visual information with a minimum of language, managing ICTs relies on routine and recognition of key icons, and handwriting is primarily a motor task (rather than written expression which involves generating language and handwriting).

In each of the eight language-loaded activities, at least 90% of participants correctly identified the challenge these presented for students with DLD. However, analysis of the low-language activities showed that a large proportion of participants also felt these would be challenging for students with DLD. For example, interpreting diagrams (63.4%), managing ICTs (44.3%) and handwriting (45.5%) were all considered challenging, despite being considered low-language tasks. It must be acknowledged that some participants may have misinterpreted handwriting (the mechanics of forming letters) to be written expression. That said, participants appeared to believe that almost all tasks would be challenging for students with DLD. This perception among participants may be, in part, due to a priming effect, as both the study and questionnaire focused on DLD. It may also reflect teachers' experiences in that language (listening, reading, speaking, writing expression) is the default mode of learning and teaching, and many students with DLD will experience

challenges with a wide range of school activities (Conti-Ramsden & Durkin, 2008; Dockrell et al., 2007; Durkin et al., 2015).

Another consideration is that participants did not differentiate between tasks by considering the language-load, leading to the belief that all tasks are challenging for students with DLD. This may be the result of the lack of clarity participants held about the language-specific nature of DLD. If teachers are not aware that DLD exists and that language, in all forms, is the source of difficulty, then their ability to interpret the potential educational impacts is hindered. This equates to a missed opportunity to inform the selection of adjustments. Furthermore, if teachers do not know that low-language tasks, visual information and hands-on activities are strengths for these students, then they will not employ them to adjust for language barriers. Examples include: if teachers perceive maps and diagrams to be challenging for students with DLD, then the potential to use these as visual supports to supplement spoken information may be missed; if a teacher does not identify the language load in a task and specifically address this barrier, the personalised adjustments implemented may have little impact; if the act of handwriting is perceived to be a challenge for students with DLD, rather than the written expression, a scribe may be provided as an adjustment. A scribe, however, does not account for the language task of shaping ideas into the right words and word combinations. Findings from these two tasks suggest that teachers may not have sufficient knowledge of DLD to consider and predict potential barriers and the educational implications for students.

In the scenario questions, participants needed to apply their knowledge in reverse and interpret the presenting characteristics of, and educational impacts experienced by, three students to determine the most likely source of impact. There

were three scenarios, and each presented subtly different information. Scenario 1 presented a student with characteristics of Speech Sound Disorder (SSD); Scenario 2 presented a student with characteristics of Attention Deficit Hyperactivity Disorder (ADHD); and Scenario 3 presented a student with characteristics of Developmental Language Disorder (DLD). Across all scenarios, participants' ability to accurately interpret the characteristics described to determine the source of impact was very low. Only 23.3% of participants accurately identified SSD in the first scenario and 6.9% accurately identified ADHD in the following scenario. While Scenario 3 received the highest number of correct responses of all three scenarios, still only 42% of participants accurately identified DLD, leaving 58% who did not. Participants' interpretation of the primary source of impact varied widely, with all 12 options presented in the multiple-choice question being selected. Most commonly participants mistook the student description of DLD for a description of general learning difficulties (21.8%) or literacy difficulties (14.9%).

The low accuracy rate in identifying DLD may reflect participants' ability to interpret educational impacts and identify a pattern of difficulty emerging as a result of a language-based disorder. Teacher participants in previous studies also performed poorly on scenario-based tasks. Both Mroz (2006) and Girolamo (2017) used scenario tasks to determine teachers' ability to recognise atypical communication development or DLD (termed SLI in Girolamo's study). Mroz (2006) identified that between 14% and 70% of early years teachers (dependent on scenario and the year level they taught) did not accurately identify atypical communication development in young children, when presented with various scenarios. Girolamo (2017) used six case studies- all students with DLD but with different profiles of language needs. Girolamo found that, while over 90% of

teachers play a role in helping to identify students with DLD, their recommendation for accessing language-specific support varied from 39.1% to 82.5% across the six case studies. This outcome suggests that participants were more easily able to identify the language-based need of some student profiles than others.

The 42% accuracy of participants in identifying DLD in Scenario 3 of the present study should be interpreted cautiously. This figure may be an overestimate of the wider teaching workforce, due to possible priming effects (as participants knew the aim of the study was to investigate knowledge of DLD) and bias (as participants who completed the survey were likely interested and invested in this topic). The possibility of a priming effect is supported by the even lower accuracy rate of Scenario 1 (SSD) at 23.3%. In this scenario, 52% of participants selected DLD rather than SSD. Alternatively, it may be indicative of the participants' difficulty in differentiating between SSD and DLD, which was illustrated in the earlier section on knowledge of DLD characteristics. Participant accuracy rate for Scenario 2 (ADHD) was even lower at 6.9%. This student description was misunderstood by participants and mistaken for a student with English as an Additional Language/Dialect (EAL/D) by 61.1% of participants, despite the student's birthplace being the only information provided that could be linked to an alternate language background. This finding also suggests that misunderstanding educational impacts is not limited to students with DLD but may be common for students with other developmental disorders or learning concerns.

The implications of commonly misinterpreting the educational impacts for students with DLD in real-life scenarios are dire. This rate of accuracy is too low for a disorder common enough that every teacher is likely to be teaching students with DLD every year (Norbury et al., 2016). If applied to the wider teaching population,

this finding suggests that the presence and educational impact of DLD is being missed for a large number of students with DLD. This also translates to a large number of teachers who are identifying some kind of learning need but who are likely implementing adjustments that are not based on knowledge of the underlying cause and characteristics. It is possible that compounding errors through the *know why* section of the knowledge chain will affect decision-making that forms the *know how* of adjustments.

Other studies have identified limitations to teacher knowledge regarding the impacts of Speech, Language and Communication Needs (SLCN), not specifically DLD. Dockrell et al. (2017) found their participants to have only a general knowledge of the implications of SLCN in learning environments. The authors stated that this left teachers in the position of only being able to react to learning needs, rather than proactively address learning needs, as is required to provide authentic access to the curriculum. Australian teacher standards and legislation expects more of teachers than simply reacting to student learning needs, yet the knowledge they have relevant to students with DLD, may not allow them to plan for and proactively address those needs (Australian Government, 2015a; Australian Institute for Teaching and School Leadership, 2017b).

Link 3. Knowledge of Adjustments

The final link in the knowledge chain is knowledge of adjustments. Participants' knowledge of adjustments was measured through the adjustment selections made for the three scenarios presented. The task required participants to apply their combined knowledge of the characteristics of DLD and educational impacts to choose the four most helpful adjustments for each student description. The same list of 12 adjustments were provided alongside each scenario. Across all

scenarios, participants had difficulty identifying the most helpful adjustments to support the students described. Scenario 1 described a student with characteristics consistent with SSD. No participants selected all four of the most helpful adjustments and only 17.2% selected three of the four. Scenario 2 described a student with characteristics consistent with ADHD. No participants identified all four most helpful adjustments, and only 10.7% selected three of the four adjustments. Scenario 3 described a student with characteristics consistent with DLD. Two participants (out of 262, 1.1%) selected all four of the most helpful adjustments, and only 11.1% identified three of the four adjustments.

The low selection rate of the most helpful adjustments for students, across all three scenarios, is concerning and indicates that most teachers are unable to reliably interpret students' presenting characteristics and discriminate between likely sources of impact. These are the foundational skills necessary to accurately identify barriers, for which adjustments need to be made. While participants' identification and selection accuracy was lower for Speech Sound Disorder (SSD) and Attention Deficit Hyperactivity Disorder (ADHD), the possibility of a priming effect favouring DLD must, again, be considered, due to DLD being the focus of the study. It is conceivable that teachers' true ability to identify and interpret the characteristics of DLD is lower than indicated by these findings. Even considering this possibility, the rate of identification and selection for DLD in this study is still well below optimum.

DLD is a prevalent disorder (Norbury et al., 2016) and the findings from this research suggest that high proportions of students with DLD may not be receiving the most helpful or appropriate adjustments to support their learning. Participants may have found this task challenging, due to limited knowledge informing the *know why* links of the knowledge chain. Selection of the most appropriate adjustments

occur when there is clarity about *why* the adjustment is needed - therefore, selection of the most appropriate adjustments for students with DLD occurs when a teacher knows that a student needs adjustments to minimise the language barriers. Knowing that language is different to speech: which educational impacts reflect a pattern of language difficulties; and how to evaluate tasks with consideration to their language-load, are all crucial elements of *know why* in the knowledge chain. These elements support teachers to recognise and consider the language demands and barriers in their classrooms.

The adjustment selection task for Scenario 3 - the student with characteristics of DLD - required participants to tap into their knowledge of language characteristics, resulting educational impacts and the likely language barriers to address. The pattern of adjustment selection for those who accurately identified DLD, when compared to those who did not, is slightly different. Firstly, for both groups a total of 74.4% of participants included the universal design principle of allowing students to demonstrate their learning through multiple modes, which was one of the most helpful adjustments for selection. This was also a commonly selected adjustment across the other two scenarios (71.4% for SSD and 67.6% for ADHD), and is a promising sign for inclusive practices in classrooms.

Participants who correctly identified DLD in Scenario 3 also commonly selected speech and/or language therapy and reduced curriculum expectations as helpful adjustments. Only the selection of 'demonstrating learning through multiple modes' aligned with the recommended most helpful adjustments. Participants' limited knowledge of the characteristics and educational impact of DLD, illustrated in the discussion previously, likely contributed to the low accuracy in selecting adjustments that addressed language barriers (e.g., asking students to show what they

mean, giving extra time to respond and explicit oral vocabulary teaching). Participant acknowledgement of the language-based source of impact, instead came in the form of the frequent selection ‘speech and/or language therapy’. This selection may indicate a) a belief that therapy external to the learning environment is more helpful than actions they can take themselves or b) that participants may not feel equipped to support students with a language-based learning need. Gradually building a student’s language capabilities, only to have them tripped up by unadjusted language in the classroom, is not inclusive practice.

Participants’ preference for ‘reduced curriculum expectations’ as an adjustment is also not an inclusive practice and does not reflect an acknowledgement of the language-based learning needs of a student with DLD. This approach does not give access to the curriculum on the same basis as peers, but rather restricts access to age-appropriate curriculum and the student's entitlement to education, having the direct opposite effect to that intended by implementing adjustments (Swancutt et al., 2020). Participants’ tendency to see most classroom activities as challenging for students with DLD, rather than differentiating based on language-load of the task, may explain why the general approach of reducing curriculum expectations was selected as a helpful adjustment.

The participants who attributed the student description to another learning need, other than DLD, commonly selected ‘behaviour plan’ and ‘extra time to answer questions and share thinking’. These selections appear to be influenced, not by a recognition of the language-based need per se, but directly by key descriptors in the scenarios. For example, “explosive behaviour” and regular “behaviour incidents” led to the selection of a behaviour plan as a favoured adjustment. Similarly, “difficulty talking about his learning”, explanations that leave people “confused” and

responses to questions “not [being] clear”, led participants to choose extra time to respond to questions and share thinking. While the latter is one of the most helpful adjustments, if it is selected with the belief that time is the barrier rather than language skills, these teachers may offer time as a frequent adjustment but not extend their repertoire into supportive questioning or scaffolding of expressive language to address the language barriers. Exploring these patterns of selected adjustments gives some insights into the array of knowledge that is underpinning the decision-making of teachers, when selecting adjustments.

This finding (of limited participant ability to select adjustments that reflect a knowledge of language needs and barriers) aligns somewhat with Girolamo (2017) findings of teacher selection of areas for improvement. Participants were presented with six scenarios in Girolamo’s study, all with different profiles of language disorder, and asked to select areas for improvement from options that included language, speech, pragmatics, fluency, and voice. Whilst all scenarios described students with some type and degree of language disorder, the participants did not always ‘see’ the language-based need. In every scenario, the majority of participants indicated they would provide some form of in-class support or intervention, but not all recommended language as an area to improve. Participants were less likely to identify the students’ language needs when they were mild, subtle, or when social interaction/behaviour concerns were involved in the description.

If the findings from this current study could be applied to the national Australian teaching population, they would suggest that identifying the effective adjustments for students with a difficulty is challenging for teachers. They would also suggest that teachers need additional support to plan effective adjustments for students to meet their obligations under the Convention on the Rights of Persons with

Disabilities, as well as the Disability Standards for Education (Australian Government Department of Education and Training, 2015; United Nations Division for Social Policy and Development Disability, 2006). With respect to DLD, the results from this study suggest that limited understanding of DLD characteristics and its educational impacts results in a 'best professional guess' as to the most helpful adjustments. Precise selection of adjustments is necessary to ensure inclusion of all students and is the culmination of the knowledge chain: accurate interpretation of students' presenting characteristics of DLD, deep understanding of resulting educational impacts, and identification of the most helpful adjustments for the student and situation. Again, these findings point to the complexity of knowing and understanding DLD, as well as the complexity of applying this knowledge to the selection of adjustments. Meanwhile, the Teacher Professional Standards from the Australian Institute for Teaching and School Leadership (AITSL), expects teachers to "know students and how they learn" including the ability to "differentiate teaching to meet the specific learning needs of students across the full range of abilities" (Australian Institute for Teaching and School Leadership, 2017a). To meet this expectation, teachers need time, support, and evidence-based training to develop their knowledge and skills.

Self-reported Knowledge

Each link in the knowledge chain was examined through self-reported data, as well as knowledge demonstration tasks. When compared, these two sources of data paint different pictures of participant knowledge. Measures of reported knowledge tend to be overestimates of capability, when compared to participants' accuracy in knowledge demonstration tasks. All self-rated items asked participants to indicate where their knowledge fell on a five-point scale of poor, limited,

reasonable, good, excellent. As Knowledge of DLD is the first link in the knowledge chain, participants were asked to rate their ability to identify students with DLD, which relied on knowing the characteristics of DLD. In response 63.8% of participants rated their ability to identify a student with DLD as reasonable or better.

Participants' confidence in their ability to identify a student with DLD, however, does not align with the knowledge they demonstrated on tasks regarding the key characteristics of DLD. For example, 81.7% of participants did not know that DLD persists into adulthood, despite intervention; 42.6% of participants could not accurately describe student characteristic/s of DLD, and most participants could not consistently differentiate between the characteristics of DLD and those of Speech Sound Disorder. These results do not align with the majority of participants rating their knowledge and skills as reasonable or better. Mroz (2006) similarly found little correlation between teacher confidence and competence. This study showed that Nursery and Primary school teachers (students 3-11yrs) gave an average confidence rating of 12.56 out of 18 for knowledge about speech sound development, expressive language, comprehension, social use of language, attention and listening, and play and language. However, Mroz (2006) identified this confidence was misplaced when significant proportions of participants did not correctly identify students (through scenarios) with speech, language, and communication needs (SLCN) who should be referred for speech pathology support.

The second link of the Knowledge Chain is knowledge of educational impacts. Participants were asked to rate their ability to recognise the educational impacts of DLD. In response, 81.3% of participants rated their skills in identifying the educational impacts of DLD as reasonable or better. In practice, however, participants' demonstrated ability to identify educational impacts did not align with

their confidence to do so. Participants demonstrated their knowledge of educational impacts when they indicated which common school activities would be challenging for a student with DLD. While all participants correctly identified language-loaded tasks as challenging, many participants still felt that low-language tasks, such as interpreting maps/diagrams (63.4%), operating ICTs (45.3%) and handwriting (43.5%), would also be challenging for students with DLD. The participants did not appear to gauge the language-load of the presented tasks, which would be necessary to determine the potential language barriers and subsequent educational impact.

The task described here was adapted from a similar task used by Dockrell and Howell (2015). These authors specifically asked participants about the perceived impact of language on literacy and found that most participants were aware that a student's reading decoding, reading comprehension, spelling, and writing texts would likely be impacted. In the current study the task was extended, asking participants to consider the impact of DLD on a wider range of school tasks. The results together may suggest that while teachers are aware of the link between oral language and literacy, their knowledge of oral language is insufficient to see and gauge the language-load more broadly.

Lending strength to this assertion are the results from the scenario identification task in which 58% of participants were not able to identify a student with DLD, from a description of the educational impacts. Interestingly, participants rated themselves significantly higher in identifying the educational impact of DLD, as compared to identifying a student with DLD; however, participant confidence in their knowledge of educational impacts did not align with their performance in knowledge demonstration tasks in this domain, either. This is perplexing and problematic, as identifying the language characteristics of DLD would be considered

necessary to interpret the resulting educational impacts and participant self-rating in identifying DLD was lower than their rating for identifying the educational impact.

The final link of the knowledge chain is knowledge of adjustments and this was assessed via asking participants to rate their ability to recognise the language demands in their pedagogy. Nine in 10 participants rated their ability as reasonable or better. However, results from the knowledge demonstration tasks outlined earlier, indicated that many participants experienced difficulty differentiating speech from language, were unaware of the language-load of tasks when considering educational impact, and could not accurately interpret the student scenarios to identify patterns of language-based learning needs. Furthermore, 77% of participants rated their ability to implement effective adjustments for students with DLD as reasonable or better. Despite this, only 1.1% of participants were able to identify all four most helpful adjustments for the student with DLD and only 11.1% were able to select three of the four most helpful adjustments. This low rate of selection of most helpful adjustments does not match the 'reasonable or better" rating made by 77% of participants. Similar to this study, Sadler (2005) asked early years teacher participants to rate their ability to cater for the educational needs of students with speech and/or language impairments (scale included: not at all confident, not very confident, reasonably confident, very confident). In contrast to the findings in this study, most participants in the Sadler study (52.8%) rated themselves as not very confident while 26.9% rated themselves as reasonably confident. Sadler (2005) did not include a measure of demonstrated knowledge as a comparison point. The current study asked about ability while Sadler asked about confidence. Participants in this study may have felt obliged to possess some level of ability across these areas as they perceive them as part of being a teacher. The term confidence, however. may

not have been viewed as a requirement and therefore allowed for more honesty. The difference in wording of questions in both studies may have altered the responses obtained with social desirability being an influencing factor.

The pattern in this current study of elevated self-reported knowledge compared to demonstrated knowledge is not unique. Of most relevance is a study by Stark et al. (2016) investigating the what teachers know about language and reading instruction in the early years. General self-rating measures of ability to teach specific skills were gathered in the early stages of the survey, then followed by knowledge and pedagogical skill questions. Statistical analysis of participant data in the Stark et al. study showed no significant correlation between overall performance on knowledge items and self-rated ability. The mean response from participants was very good (on a scale of minimal, moderate, very good, expert) for teaching phonemic awareness, phonics, fluency, vocabulary, comprehension, and spelling. Stark and colleagues also asked if participants felt confident in their responses at the end of the survey. On this question, 59% indicated they did not feel confident, aligning more closely with the results in the Sadler study. It seems that terms of ability and confidence may lead to different responses from teacher participants. Divergence between ability and confidence, as well as perceived knowledge and actual knowledge, has implications for how teachers go about their work, when they seek additional specialist support or pursue professional learning. It is difficult to address a knowledge gap, if it is not recognised as a gap, but it may be possible address an area of low confidence.

Potential Influences on Teacher Knowledge

The factors of years of experience, training and speech pathology support were investigated for their potential influence on teacher knowledge of DLD.

Investigation of years of teaching experience were examined based on the following categories: 0-5 years, 6-10 years, 11-20 years, and more than 20 years. Self-reported ability on identifying DLD, recognising the educational impacts of DLD, identifying the language demands in pedagogy and implementation of relevant adjustments were all compared. These comparisons showed minimal differences in self-reported knowledge between groups with the only significant difference being that early career teachers (0-5 years) rated themselves lower than other experience groups in identifying students with DLD. This suggests appropriate caution in a likely new knowledge domain for early career teachers. Despite the cautions of early career teachers, there was no significant difference between experience groups as to how well they could differentiate impacts of DLD from impacts of Speech Sound Disorder (SSD). Stark et al. (2016) also compared self-rated ability to years of experience and found that there was a strong statistical correlation between increased years of teaching and higher self-rated ability, but this did not correlate to knowledge. These findings imply that assumptions should not be made about teachers' knowledge related to DLD, based on years of teaching experience. It is likely that all teachers would benefit from deeper and more specific knowledge of the language characteristics of DLD.

In this study, participants' training, relating to DLD and support of students with DLD, was investigated. A large proportion of participants (43.9%) felt they had not received relevant training in their education studies and only some (35.9%) had pursued additional professional learning to meet this need. A lack of relevant training is commonly reported in other studies: Dockrell et al. (2017) - 61% of participants; Mroz (2006) - 26% no training, 56% brief coverage; and Sadler (2005) - 71% participants. Some participants had indicated that this was a barrier to effective

practice (Dockrell & Howell, 2015; Dockrell et al., 2017). For this reason, training in the area of language disorder and support of students with language disorder was investigated to see if it had a positive impact for teacher knowledge, as would be expected as a result of training. Participants who sought additional relevant training in this study showed higher self-rated abilities in all domains (identifying DLD, recognising educational impacts, recognising the language demands in pedagogy and implementing adjustments) than participants who had no training or undergraduate training only. This higher self-rating however, did not translate to a higher accuracy rate in demonstrated knowledge tasks, than participants who had not attended additional training. Participants with post-graduate training about language disorder rated themselves higher in all of the self-rated knowledge domains, compared to those who had only undergraduate teacher education and those who had no training.

Stark et al. (2016) also found that teachers who had completed additional training, in that case literacy-focused postgraduate qualification, did not perform statistically significantly better on knowledge items compared to those who had not completed additional study. These findings have implications for those seeking to deliver training to teachers on these topics. Mockler (2012) makes a case for abandoning traditional forms of professional learning served on a one-size-fits-all platter to embrace formation-focused work to support teachers build knowledge and skills within their own context (Mockler, 2012). This aligns with Shulman's (2004) suggestion that linking theory and practice is best done through the use of cases, where the organised and systematic information about theories can be discussed and applied in the messy and uncertain context of real-life practice. The suggestion from both authors is that this more authentic and personalised approach can build an "agile teaching profession with a strong sense of purpose and a confidence in their own

judgement and agency" (Mockler, 2012, p. 45). This approach to professional learning may well be worth considering, to avoid the assumptions of learning by virtue of attendance at a workshop or conference, which could lead to increased confidence without increased knowledge.

Investigation into the influence of speech pathology support revealed that specific and targeted speech pathology (SP) support for teachers may lead to increased self-rated abilities, as well as some improved knowledge. The four participant groups in this investigation were those who had received no SP support, general SP support, 1-2 types of targeted SP support, and 3-4 types of targeted SP support. General support included activities such as: assessment; report; direct intervention or therapy; and general professional learning; while targeted supports included activities, which contributed to teachers' knowledge about students' profile of language, educational needs, and targeted adjustments. Those who had received no SP support rated themselves significantly lower than all other groups in all four categories: identifying DLD, recognising educational impacts of DLD, recognising the language demands in pedagogy, and using effective adjustments. Those who had received general SP support rated themselves significantly lower than those with targeted supports in recognising the educational impacts and using effective adjustments. The group who had received 3-4 types of targeted SP support performed significantly better when differentiating characteristics of DLD from SSD. These preliminary findings suggest that not all types of speech pathology support are equal, if the aim is to improve teachers' inclusive practice and implementation of adjustments. These results a suggest that supports focused on linking knowledge to practice may lead to changes in practice that other types of speech pathology support

do not. Further investigation into how much and what types of speech pathology support would be beneficial.

Suggestions for Support

Given the findings in this study, there are some practical supports that may be pursued to assist teachers in the complex endeavour of including students with DLD. Firstly, raising awareness and refining knowledge of DLD, educational impacts and adjustments is crucial. Knowledge of the oral-language nature of DLD, its variable presentations, impact on learning and life, prevalence, and persistence across years of schooling would constitute the first link of the knowledge chain: knowledge of DLD. This knowledge would help teachers to really 'see' and understand the students in front of them, who previously either 'flew under the radar' or were 'hiding in plain sight' (Tancredi, 2018, p. 2). Secondly, helping teachers to know and see the language demands and language barriers that exist in a typical day at school will assist in being able to predict the challenges that students with DLD will face and make proactive plans to address these. This set of knowledge would constitute the second link in the knowledge chain - that of functional impacts - and may need to be built in partnership with a speech pathologist, who can help provide this perspective. From this point, theoretical knowledge can inform the practical knowledge to act (Shulman & Wilson, 2004). This practical knowledge, knowledge of adjustments, is the third link of the knowledge chain. Being able to see the functional impacts and the language-based cause of these impacts, sets a teacher up with the right professional knowledge for them to consider the most appropriate adjustments that minimise the language barriers. Finally, the application of professional judgement allows teachers to execute well-formulated plans in the constantly changing environment of the classroom.

Another consideration for supporting class teachers, is the way in which workforce development in this area is progressed. Two key findings indicate how support for teachers could be redesigned. One being the caution about training as results suggest that this may lead to confidence but not knowledge growth. The second being the greater impact of targeted speech pathology support on knowledge of DLD compared to general speech pathology support. This type of complex and intellectual knowledge-building likely best occurs through focused collaboration with support teachers and speech pathologists, based in a teacher's current work: their data, their students, their curriculum, their classroom. An ongoing partnership strengthening the links of the knowledge chain.

Consultation with students about adjustments is one of the key ingredients of inclusive practice (Australian Government Department of Education and Training, 2015; Tancredi et al., 2020). Teachers might be well-served by developing and embracing the practice of consulting with students with DLD about the practices that help them learn, barriers that get in their way, and adjustments they find effective. Recent research has shown that consultation with students who have DLD can result in helpful insights into their challenges with language and learning and that they can outline the adjustments they would find most helpful (Tancredi, 2019; Tancredi et al., 2020). Ultimately there is a lot to be learned about students with DLD and from students with DLD to genuinely understand them and ensure their entitlement to learn and achieve alongside their peers.

Limitations

As with all research, there are limitations to this study. First, it is acknowledged that convenience sampling is not the most robust form of sampling and may lead to data that are not representative of the wider population (Fowler Jr,

2013). Reliance on volunteers may have also resulted in engagement by those who have an interest in inclusion, language development and language disorder. Therefore, this project may not have captured the knowledge of teachers who are indifferent to the topic and did not choose to participate. This may have led to an overestimate of teacher knowledge in the areas examined. This possible overestimate of knowledge may limit the ability to generalise results to the wider teaching population.

Second, the use of primarily closed questions and quantitative data analysis allowed for descriptive statistical understanding of teachers' knowledge related to DLD but did not give broad opportunity to delve into the nuanced understandings that individuals hold, in terms of learner characteristics, educational impacts and appropriate adjustments. While these limitations are acknowledged, the design and methodology of this project remain appropriate and helpful in responding to the key research questions, especially given the nature and scope of this project.

Future Research

This M.Phil presents findings from a sample of Queensland teachers and forms the basis for further investigation into Australian teachers' knowledge of DLD and inclusive practice. The findings also indicate how support for teachers might be refined to enhance their ability to support students with DLD. The data gathered, analysed and discussed here need to be replicated with a representative sample of Australian teachers, from all states, sectors and phases of schooling, in order to develop an accurate understanding of teacher knowledge in the key domains for DLD, educational impacts and adjustments. Use of other methodologies would assist in understanding the nuanced and individual teacher knowledge of DLD, confirming, or refining the proposed knowledge chain.

Investigating how relevant teacher knowledge is developed, what knowledge is critical for making quality adjustments and how the knowledge is deployed by teachers in real-time in classrooms is one way this investigation can be extended. Research that examines how teachers come to understand students with DLD and make decisions about adjustments, in situ, will assist in further understanding teacher knowledge and how it informs action, specifically with regards to meeting student entitlement and teacher expectations.

Conclusion

Students with DLD in Australian schools are at risk of being casualties of teachers' best efforts, in the absence of essential knowledge. By and large teachers engage in their work with good will and good intention, but time, energy and enthusiasm are no substitute for the precise knowledge necessary for precision of practice. Teachers are charged with an incredibly important and complex task: to provide each student with their entitlement to an inclusive education. This task becomes impossible if teachers do not have a means to understand *each* student. The expectations on teachers are incredibly high and the fallout of not meeting these expectations for students is disastrous. The requirement for teachers to integrate knowledge across domains, in order to understand individual learners and the barriers to their learning, is sophisticated, intellectual work. DLD is not simple and nor is the process of interpreting educational impact or determining the most effective adjustments - and this is all before even setting foot into the classroom to execute the plan. Teachers need to be supported so they can meet their obligations and, critically, so students with DLD can be provided their educational entitlement. This is the challenge of inclusive practice.

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Appendix A

Participant Information and Questionnaire

Meeting the needs of students:
What NSW and QLD teachers know about Developmental Language Disorder

Participant Information for QUT Research Project
QUT Ethics Approval Number 100001050

Research Team

Principal Researcher:
Miss Jaedene Glasby (M.Phil Candidate)

Associate Researchers:
Professor Linda Graham (Principal Supervisor)
Associate Professor Sonia White (Associate Supervisor)

School of Early Childhood and Inclusive Education
Faculty of Education
Queensland University of Technology (QUT)

Description

This research project is being undertaken as part of a Master of Philosophy study by Jaedene Glasby.

Purpose: The purpose of the research project is to investigate teachers' knowledge of students with Developmental Language Disorder and the most appropriate adjustments to support them.

Focus: Language is the systematic means we use to communicate with each other. It is the words we use and how we combine them to share ideas and messages. It is about what we understand and what we say. Some students have a language disorder not connected with other diagnoses, that impacts on their daily life. These are the students that are the focus of this questionnaire.

Terms: Many terms have been, and are used, to refer to students with a language disorder not connected with other diagnoses.
Some of these include: Specific Language Impairment, Language Impairment, Language Learning Impairment, Primary Language Impairment, Language Disorder and often, simply language difficulties. Recently, international agreement has been reached to move forward

using the term Developmental Language Disorder and this is the term used throughout this survey.

You are invited to participate in this research if you are a current primary or secondary school teacher in NSW or QLD. The views of teachers across both phases of schooling are welcomed and encouraged.

Participation

Participation will involve completing a brief, anonymous, online questionnaire. It can be completed on a desktop computer, tablet, or smartphone. It contains 28 click-response questions and will take approximately **15 mins** of your time.

The questionnaire seeks information about basic demographics as well as knowledge of language disorder and relevant adjustments. Closed and open questions are used with three student scenarios.

Your participation in this research project is entirely voluntary. Participation is anonymous so will not impact on your current or future relationship with your school, organisation, QUT or associated external organisations. If you do agree to participate, you may cease at any point during the questionnaire without comment or penalty. However, as the questionnaire is anonymous, once it has been submitted it will not be possible to withdraw.

Expected benefits

You will be provided with links to additional information about students with Developmental Language Disorder and classroom strategies upon completion of this questionnaire. It is hoped that the results of the final research will contribute to teacher education, teacher professional learning and workforce planning.

Risks

This is a low risk research project. The potential risks include the time required to complete the questionnaire and personal discomfort in acknowledging possible limitations in professional knowledge. The questionnaire is anonymous and has been piloted and adjusted to account for these risks.

Privacy and Confidentiality

All comments and responses are anonymous. The names of individual persons are not required in any of the responses. Any data collected as part of this research project will be stored securely as per QUT's Guidelines for the Management of Research Data.

Consent to Participate

Submitting the completed online questionnaire is accepted as an indication of your consent to participate in this research project.

Questions / further information about the research project

If you have any questions or require further information, please contact one of the listed researchers:

Jaedene Glasby jaedeneterese.glasby@hdr.qut.edu.au
Linda Graham linda.graham@qut.edu.au

Concerns / complaints regarding the conduct of the research project

QUT is committed to research integrity and the ethical conduct of research projects. However, if you do have any concerns or complaints about the ethical conduct of the research project, you may contact the QUT Research Ethics Advisory Team on 07 3138 5123 or email humanethics@qut.edu.au. The QUT Research Ethics Advisory Team is not connected with the research project and can facilitate a resolution to your concern in an impartial manner.

THANK YOU FOR HELPING THIS RESEARCH PROJECT.

Meeting the needs of students:
What NSW and QLD teachers know about Developmental Language Disorder

Eligibility to Participate

* 1. Are you currently teaching in a primary or secondary school in either New South Wales or Queensland?

- ◯ Yes
- ◯ No

Meeting the needs of students:
What NSW and QLD teachers know about Developmental Language Disorder

Background Information

* 2. In which state do you currently teach?

- ◯ New South Wales
- ◯ Queensland

* 3. In which phase of schooling do you **primarily** work?

- ◯ Primary
- ◯ Secondary

* 4. Which education sector do you work for? (If more than one, select main sector).

- ◯ Catholic
- ◯ Government
- ◯ Independent

* 5. Please indicate your gender:

- ◯ Female
- ◯ Male
- ◯ Other

* 6. What **teaching qualification/s** do you hold? (select all that apply)

- ☐ Bachelor of Education
- ☐ Graduate Diploma of Education
- ☐ Master of Teaching
- ☐ Other (please specify)

7. Please outline any additional qualifications, in **any discipline other than education**, below:

* 8. How many years have you been teaching?

- ◯ 0-2 years
- ◯ 3-5 years
- ◯ 6-10 years
- ◯ 11-20 years
- ◯ More than 20 years

* 9. What best describes your **current** role?

- ◯ Classroom teacher
- ◯ Relief/supply teacher
- ◯ Special education teacher
- ◯ Specialist advisory teacher
- ◯ Learning support teacher

Please indicate key subject areas you are teaching:

* 10. Describe some common learning characteristics of students with Developmental Language Disorder.

Meeting the needs of students:
What NSW and QLD teachers know about Developmental Language Disorder

Scenarios

In this section, there are three scenarios describing students in various year levels.
We are interested in your interpretation of:

- **Characteristics impacting students' learning**
- **Adjustments you would make to support the student**

The scenarios represent a range of student ages. Even if you teach a different age group, your response is appreciated for all scenarios.

Meeting the needs of students:
What NSW and QLD teachers know about Developmental Language Disorder

Scenarios

* 11. Scenario 1 - Jaydin, Year 1

Jaydin is in Year 1. He is typically very quiet and is having difficulty making friends. When he does talk, he is difficult to understand. If he is not understood by someone, he tends to abandon the interaction rather than try again. Jaydin is in the bottom group for reading. He can be disruptive in small group literacy focused tasks and will sometimes remove himself from the group. He loves sport and is keen to join in group games, however there are often misunderstandings. When these misunderstandings occur, Jaydin sometimes lashes out at his peers. He has complained to his mother about being teased with other kids asking him to say "Worcestershire Sauce". In term one's parent-teacher meeting, his mother said that Jaydin was a late talker but that he will "talk the ear off" people he knows well about his favourite topics – sport and horses.

What do you feel is the **primary characteristic** impacting Jaydin's learning?
Please consider all options provided.

- ◯ Attention Deficit Hyperactivity Disorder
- ◯ Autism Spectrum Disorder
- ◯ Childhood Complex Trauma
- ◯ English as an Additional Language or Dialect (EAL/D)
- ◯ Developmental Language Disorder
- ◯ Hearing Impairment
- ◯ Intellectual Disability
- ◯ Learning difficulties
- ◯ Literacy difficulties
- ◯ Social/emotional difficulties
- ◯ Speech Sound Disorder

* 12. Scenario 1 - Jaydin, Year 1

Jaydin is in Year 1. He is typically very quiet and is having difficulty making friends. When he does talk, he is difficult to understand. If he is not understood by someone, he tends to abandon the interaction rather than try again. Jaydin is in the bottom group for reading. He can be disruptive in small group literacy focused tasks and will sometimes remove himself from the group. He loves sport and is keen to join in group games, however there are often misunderstandings. When these misunderstandings occur, Jaydin sometimes lashes out at his peers. He has complained to his mother about being teased with other kids asking him to say "Worcestershire Sauce". In term one's parent-teacher meeting, his mother said that Jaydin was a late talker but that he will "talk the ear off" people he knows well about his favourite topics – sport and horses.

You selected {{ Q11 }} as the **primary characteristic** impacting on Jaydin's learning. Based on this, which **four adjustments** would **best support** Jaydin's learning?

- [ ] Ask student to show what they mean (act out, use gesture, draw etc)
- [ ] Behaviour plan
- [ ] Cue attention to important information
- [ ] Demonstrate learning through multiple modes (other than speaking/writing)
- [ ] Explicit (oral) vocabulary teaching
- [ ] Extra time to answer questions and share thinking
- [ ] Monitor phonics and spelling development (provide more explicit teaching as needed)
- [ ] Reduced curriculum expectations (reduced complexity of content)
- [ ] Reiterate key points
- [ ] Social skills sessions
- [ ] Speech and/or language therapy (1:1 targeted intervention)
- [ ] 1:1 teacher aide time

* 13. Scenario 2 - Moses, Year 4

Moses was born in Sudan and migrated to Australia with his parents at age two. His teacher is concerned about his learning across curriculum areas. He rarely finishes work and what he does produce has many errors. While Moses appears keen to learn, he seems to miss key pieces of information. In the classroom Moses likes to take on the 'helper' role. He moves around offering to do jobs even when he should be working. He often comes to class without his books and pens, takes a long time to begin and complete tasks, and spends much of class time talking to the students next to him. He often gets in trouble for not following instructions.

What do you feel is the **primary characteristic** impacting on Moses' learning?
Please consider all options provided.

- ( ) Attention Deficit Hyperactivity Disorder
- ( ) Autism Spectrum Disorder
- ( ) Childhood Complex Trauma
- ( ) Developmental Language Disorder
- ( ) English as an Additional Language or Dialect (EAL/D)
- ( ) Hearing Impairment
- ( ) Intellectual Disability
- ( ) Learning difficulties
- ( ) Literacy difficulties
- ( ) Social/emotional difficulties
- ( ) Speech Sound Disorder

* 14. Scenario 2 - Moses, Year 4

Moses was born in Sudan and migrated to Australia with his parents at age two. His teacher is concerned about his learning across curriculum areas. He rarely finishes work and what he does produce has many errors. While Moses appears keen to learn, he seems to miss key pieces of information. In the classroom Moses likes to take on the 'helper' role. He moves around offering to do jobs even when he should be working. He often comes to class without his books and pens, takes a long time to begin and complete tasks, and spends much of class time talking to the students next to him. He often gets in trouble for not following instructions.

You selected {{ Q13 }} as the primary characteristic impacting Moses' learning. Based on this, which **four adjustments** would **best support** Moses' learning?

- [ ] Ask students to show what they mean (act out, use gesture draw etc)
- [ ] Behaviour plan
- [ ] Cue attention to important information
- [ ] Demonstrate learning through multiple modes (other than speaking/writing)
- [ ] Explicit (oral) vocabulary teaching
- [ ] Extra time to answer questions and share thinking
- [ ] Reduced curriculum expectations (reduced complexity of content or teaching out of year level/phase)
- [ ] Monitor phonics and spelling development (provide more explicit teaching as needed)
- [ ] Reiterate key points
- [ ] Social skills sessions
- [ ] Speech and/or language therapy (1:1 targeted intervention)
- [ ] 1:1 teacher aide time

* 15. Scenario 3 - Tom, Year 10

Tom's teachers are concerned about poor grades and explosive behaviour. He dislikes school and has behaviour incidents recorded most days. When Tom tries to explain these incidents, he does not sound truthful and his Head of Year is confused about what went on. Tom rarely submits assignments and is achieving 'Ds' and 'Es'. He detests writing and actively avoids it. The written work he does produce contains poorly constructed sentences, many grammatical errors and generic vocabulary. Tom also has difficulty talking about his learning. His responses to questions and explanations often need clarifying as the meaning is not clear. His teachers are frustrated as Tom often doesn't listen and fails to follow their instructions.

What do you feel is the **primary characteristic** impacting on Tom's learning?
Please consider all options provided.

- ( ) Attention Deficit Hyperactivity Disorder
- ( ) Autism Spectrum Disorder
- ( ) Childhood Complex Trauma
- ( ) English as an Additional Language or Dialect (EAL/D)
- ( ) Developmental Language Disorder
- ( ) Hearing Impairment
- ( ) Intellectual Disability
- ( ) Learning difficulties
- ( ) Literacy difficulties
- ( ) Social/emotional difficulties
- ( ) Speech Sound Disorder

* 16. Scenario 3 - Tom, Year 10

Tom's teachers are concerned about poor grades and explosive behaviour. He dislikes school and has behaviour incidents recorded most days. When Tom tries to explain these incidents, he does not sound truthful and his Head of Year is confused about what went on. Tom rarely submits assignments and is achieving 'Ds' and 'Es'. He detests writing and actively avoids it. The written work he does produce contains poorly constructed sentences, many grammatical errors and generic vocabulary. Tom also has difficulty talking about his learning. His responses to questions and explanations often need clarifying as the meaning is not clear. His teachers are frustrated as Tom often doesn't listen and fails to follow their instructions.

You selected {{ Q15 }} as the **primary characteristic** impacting Tom's learning. Based on this, which **four adjustments** would **best support** Tom's learning?

- [ ] Ask student to show what they mean (act out, use gestures draw etc)
- [ ] Behaviour plan
- [ ] Cue attention to important information
- [ ] Demonstrate learning through multiple modes (other than speaking/writing)
- [ ] Explicit (oral) vocabulary teaching
- [ ] Extra time to answer questions and share thinking
- [ ] Monitor phonics and spelling development (provide more explicit teaching as needed)
- [ ] Reduced curriculum expectations (reduced complexity of content or teaching out of year level/phase)
- [ ] Reiterate key points
- [ ] Social skills sessions
- [ ] Speech and/or language therapy (1:1 targeted intervention)
- [ ] 1:1 teacher aide time

Meeting the needs of students: What NSW and QLD teachers know about Developmental Language Disorder

Previous Experience

* 17. Have you received training or professional learning about:

	No	Yes, initial teacher education	Yes, other professional learning	Unsure
Typical language development	○	○	○	○
Links between language and literacy	○	○	○	○
Language disorders	○	○	○	○
Strategies to support children with language disorders	○	○	○	○

* 18. Do you think you have you ever taught a student with Developmental Language Disorder (either formally diagnosed or not)?

- ○ Yes
- ○ No
- ○ Unsure

* 19. How often do you think you have taught a student with Developmental Language Disorder (either formally diagnosed or not)?

Once	Occasionally	Most years I have taught	Every year I have taught

* 20. Have you ever received assistance from a speech pathologist when teaching a student with Developmental Language Disorder?

- ◯ Yes
- ◯ No

* 21. What type of assistance have you received from speech pathologist/s? (select all that apply)

- ☐ Assessment of language skills (with report and/or feedback)
- ☐ Classroom observation and advice on appropriate adjustments/classroom strategies
- ☐ Demonstration of adjustments/strategies
- ☐ Detailed outline of the student/s communication skills or need
- ☐ Identification of the language demands of the curriculum/classroom
- ☐ Professional learning or training (formal or informal)
- ☐ Program for you/another staff member to carry out
- ☐ Setting language goals (e.g. IEP meeting or similar)
- ☐ Speech pathology intervention - in the classroom
- ☐ Speech pathology intervention - withdrawal from the classroom/outside of school
- ☐ Other (please specify)

* 22. Does your current school have access to speech pathology support?

- ◯ No
- ◯ Yes
- ◯ Unsure

23. Is the speech pathologist:

- ◯ A member of school staff/employed by the education organisation
- ◯ A private provider
- ◯ Unsure

* 24. How would you rate your ability to:

	Poor	Limited	Reasonable	Good	Excellent
Identify students with Developmental Language Disorder	○	○	○	○	○
Recognise the educational impact of Developmental Language Disorder	○	○	○	○	○
Recognise the language demands in your pedagogy	○	○	○	○	○
Use effective classroom adjustments for Developmental Language Disorder	○	○	○	○	○

* 25. Who do you believe holds **primary responsibility** for ensuring a student with Developmental Language Disorder is able to access, engage and participate in the curriculum?

- ○ Classroom teacher/s
- ○ Learning support teacher
- ○ Principal/Leadership team
- ○ Specialist advisory teacher
- ○ Speech pathologist/other professional
- ○ Teacher aide

Other (please specify)

* 26. A distinction exists between a speech disorder and a language disorder. Each affects a range of skill areas but in some instances they overlap. Consider the following and indicate which tasks students with Developmental Language Disorder or students with Speech Sound Disorder may or may not find difficult:

	Speech	Language	Both	Neither	Unsure
Being intelligible to others	○	○	○	○	○
Following directions	○	○	○	○	○
Learning & understanding new words	○	○	○	○	○
Participating in conversations	○	○	○	○	○
Producing sounds correctly	○	○	○	○	○
Retelling an event/story in order	○	○	○	○	○
Enunciating clearly	○	○	○	○	○
Using complex sentences	○	○	○	○	○
Understanding grammar (e.g. past tense)	○	○	○	○	○
Using sophisticated vocabulary	○	○	○	○	○

* 27. For school aged children with a Developmental Language Disorder, do you think their language skills will:

- ○ Catch up and match peers' language skills -- if given time
- ○ Catch up and match peers' language skills -- if provided with language intervention/therapy
- ○ Never catch up or match peers' language skills

* 28. For students with Developmental Language Disorder, school can present certain challenges. Which of the following activities would Developmental Language Disorder likely impact:

	Yes	No	Unsure
Completing a written assignment or task	○	○	○
Following instructions	○	○	○
Handwriting	○	○	○
Interacting with peers and staff	○	○	○
Interpreting maps/diagrams	○	○	○
Learning number facts	○	○	○
Lining up for class	○	○	○
Managing/operating ICTs (e.g., iPad)	○	○	○
Participating in class discussions	○	○	○
Reading	○	○	○
Spelling	○	○	○
Taking a test	○	○	○
Understanding curriculum content	○	○	○

Meeting the needs of students:
What NSW and QLD teachers know about Developmental Language Disorder

QUESTIONNAIRE COMPLETED!

Thank you for your time in completing this survey. Your insights are very much appreciated.

If you have any further questions, please contact: Jaedene Glasby (jaedeneterese.glasby@hdr.qut.edu.au)

If you would like to learn more about students with Developmental Language Disorder, please follow the links below.

- Raising Awareness of Developmental Language Disorder – You Tube channel
- Raising Awareness of Developmental Language Disorder - Website with resources
- Wikipedia – Developmental Language Disorder

Or search the #DevLangDis on twitter.

Appendix B

Summary of Data from New South Wales Participants

The original target sample for this project was 384 registered teachers from government, Catholic and Independent schools in New South Wales (NSW) and Queensland QLD), Australia. A stratified sample of 384 participants across the two states was sought to gain a broad range of perspectives and to reflect the distribution of teachers across both states. This would constitute a sample of 60% (n=234) NSW participants and 40% (n=154) QLD participants (Australian Bureau of Statistics, 2018). Recruitment however did not net this sample size from NSW, nor allow for stratification across states. A total of 21 NSW participants completed the online questionnaire which was too few participants to make a meaningful state-based comparison. These 21 participants data were not included in the reported results in the body of this thesis. The data from these NSW participants however is summarised here for reference. Demographic data is followed by data relevant to each of the research questions in turn.

Demographic Data

Table B1

Demographic Data of New South Wales Participants

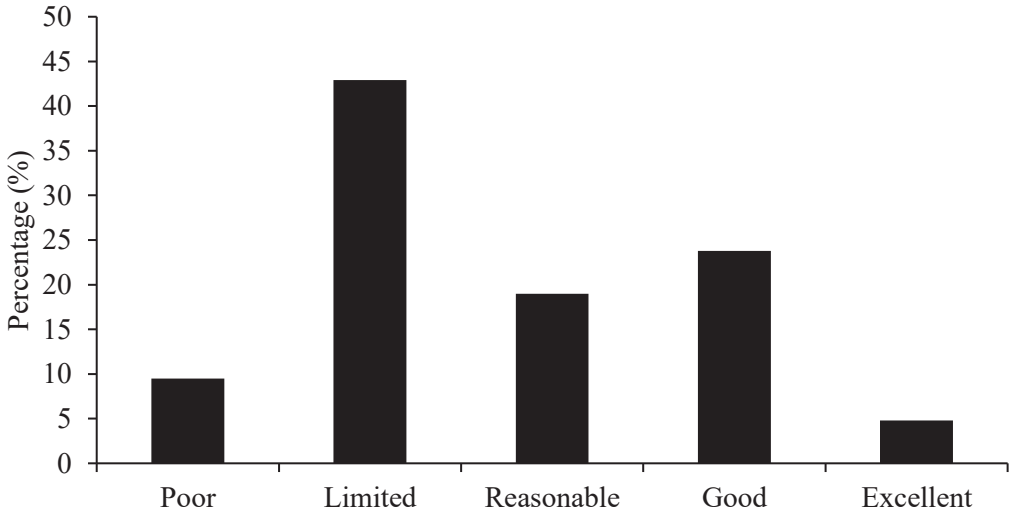
		n (%)
Gender	Female	20 (95.2%)
	Male	1 (4.8%)
	Other	0 (0%)
Sector	Catholic	6 (28.6%)
	Government	7 (33.3%)
	Independent	8 (38.1%)
Phase of schooling	Primary	13 (61.9%)
	Secondary	8 (38.1%)
Yrs. Experience	0-2 years	3 (14.3%)
	3-5 years	2 (9.5%)
	6-10 years	1 (4.8%)
	11-20 years	6 (28.6%)
	More than 20 years	9 (42.9%)
Role	Classroom teacher	9 (42.9%)
	Special education teacher	3 (14.3%)
	Learning support teacher	5 (23.8%)
	Specialist advisory teacher	2 (9.5%)
	Relief/supply teacher	2 (9.5%)
Highest level of qualification	Diploma of Education	0 (0%)
	Bachelor of Education	6 (28.6%)
	Graduate Diploma in Education	1 (4.8%)
	Graduate Certificate	2 (9.5%)
	Master of Teaching or Education	11 (52.3%)

RQ1 Part (i) Learner Characteristics of Developmental Language Disorder

Self-reported knowledge. Teachers' ability to identify the presenting characteristics of students with DLD was assessed in three ways. First, all participants were asked to self-rate their ability to identify students with DLD, using a five-point scale (1 = poor, 2= limited, 3 = reasonable, 4= good, 5 = excellent). Self-reported knowledge.

Figure B1

Participant Self-rated Ability to Identify Students with DLD (n=21)



Knowledge demonstration – differentiating characteristics of DLD from Speech Sound Disorder (SSD). Participants were provided with a list of 10 characteristics commonly displayed by students with communication difficulties in the classroom. They were then asked to identify whether each listed characteristic was typical of difficulty with speech or language, both or neither. Participants could also select unsure. The task was designed to determine if participants could differentiate between the characteristics of language difficulties compared to characteristics of speech difficulties. Six of the 10 listed characteristics were language specific difficulties typical of DLD, three characteristics were speech

specific difficulties, and one characteristic was common to difficulties with both speech and language. The spread of participant responses to these characteristics are presented in Table B2, with correct responses highlighted in grey. Italicised are the responses for which most participants responded correctly. Bolded are the responses for which most participants responded incorrectly.

Table B2

Participant Knowledge of Characteristics of Developmental Language Disorder as Compared to Speech Sound Disorder (correct responses are grey, correct responses by most participants italicised, incorrect responses by most participants bolded)

	Main source of difficulty				
	Speech	**Language**	**Both**	**Neither**	**Unsure**
Difficulty with:	n (%)	n (%)	n (%)	n (%)	n (%)
Enunciating clearly	*11 (52.4)*	0 (0)	10 (47.6)	0 (0)	0 (0)
Producing sounds correctly	10 (47.6)	0 (0)	**11 (52.4)**	0 (0)	0 (0)
Being intelligible to others	1 (4.8)	1 (4.8)	**19 (90.5)**	0 (0)	0 (0)
Understanding grammar (e.g. tense)	0 (0)	*13 (61.9)*	7 (33.3)	0 (0)	1 (4.8)
Following directions	0 (0)	*13 (61.9)*	8 (38.1)	0 (0)	0 (0)
Retelling an event/story in order	0 (0)	11 (52.4)	**9 (42.9)**	0 (0)	0 (0)
Using sophisticated vocabulary	0 (0)	7 (33.3)	**14 (66.7)**	0 (0)	0 (0)
Learning & understanding new words	0 (0)	6 (28.6)	**15 (71.4)**	0 (0)	0 (0)
Using complex sentences	0 (0)	6 (28.6)	**15 (71.4)**	0 (0)	0 (0)
Participating in conversations	0 (0)	1 (4.8)	*19 (90.5)*	1 (4.8)	0 (0)

Knowledge demonstration – DLD is persistent. Participants' knowledge of this characteristic was examined by a question that asked their thoughts on the longevity or prognosis of DLD.

Table B3

Participant Knowledge of the Prognosis of DD (correct response highlighted in grey)

Children with DLD:	**n (%)**
Catch up and match peers' language skills – if given time	0 (0)
Catch up and match peers' language skills – if provided with language intervention/therapy	15 (71.4)
Never catch up or match peers' language skills	6 (28.6)

Participants were asked to provide an open-ended response to describe the common learning characteristics of students with DLD. Participant responses were coded against seven categories that emerged from the data using inductive content analysis.

Table B4

Coding Categories and Participant Responses when Describing Common Learning Characteristics of Students with DLD (n=21)

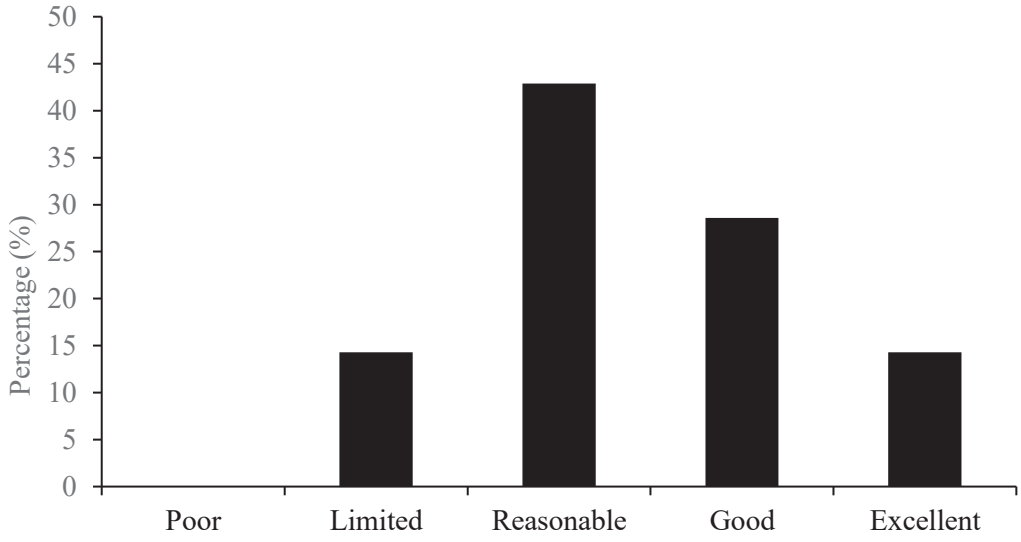
Code	Descriptor	n (%)
0	**I don't know/unsure**	2 (9.5)
1	**Correct description** – participant described common learning characteristics of students with DLD and highlighted the core component of spoken language difficulties	12 (57.1)
2	**Partially correct** – participant described common learning characteristics of students with DLD *but did not* highlight the core component of spoken language difficulties; learning characteristics could apply to other developmental disorders	1 (4.8)
3	**Partially correct** – participant described common learning characteristics of students with DLD *but* also described learning characteristics of other speech, language and communication needs (SLCN) such as articulation and stuttering	1 (4.8)
4	**Partially correct** – participant described common learning characteristics of students with DLD *but* also described other disorders or unrelated learning needs	2 (9.5)
5	**Incorrect** – participant did not describe any common learning characteristics of students with DLD	0
6	**No response**	0

RQ1 Part (ii) Educational Impacts of DLD

Self-reported knowledge. Participants' knowledge of educational impacts for students with DLD was examined in two ways: first, through a self-reported knowledge question, followed by a multiple-choice knowledge demonstration task. First, participants were asked to rate their ability to recognise the educational impacts of DLD on a five-point scale (1 = poor, 2= limited, 3 = reasonable, 4= good, 5 = excellent).

Figure B2

Self-rated Ability to Identify Educational Impacts of DLD (n=21)



Knowledge demonstration – educational impacts of school tasks.

Participants were presented with a matrix to indicate which common classroom activities DLD would likely impact. Of the 13 options presented, eight were language-based tasks and therefore impacted by DLD. Five contrasting low-language tasks were included. These tasks inherently involve supportive visual information or concrete materials, which lessen the load on language skills. For each

item, participants indicated whether DLD would impact on a students' engagement in the task with a yes, no or unsure. Items are grouped in order of response in Table B5 and correct responses are highlighted in grey. In the survey, however, items were presented in alphabetical order and not grouped.

Table B5

Knowledge of Classroom Activities that are Likely Impacted by DLD (n=21)

	Which of the following activities would DLD likely impact?	**YES n (%)**	**NO n (%)**	**UNSURE n (%)**
Language-based tasks	Following instructions	20 (95.2)	1 (4.8)	0 (0)
	Interacting with peers and staff	20 (95.2)	0 (0)	1 (4.8)
	Participating in class discussions	21 (100)	0 (0)	0 (0)
	Reading	21 (100)	0 (0)	0 (0)
	Spelling	21 (100)	0 (0)	1 (4.8)
	Taking a test	21 (100)	0 (0)	0 (0)
	Understanding curriculum content	20 (95.2)	0 (0)	1 (4.8)
	Completing a written assignment or task	20 (95.2)	0 (0)	1 (4.8)
Low-language tasks	Interpreting maps/diagrams	14 (66.7)	2 (9.5)	5 (3.8)
	Learning number facts	10 (47.6)	5 (23.8)	6 (28.6)
	Lining up for class	10 (47.6)	9 (42.9)	2 (9.5)
	Managing/operating ICTs (e.g., iPad)	8 (31.8)	6 (28.6)	7 (33.3)
	Handwriting	8 (31.8)	6 (28.6)	7 (33.3)

RQ 2. Identification, Knowledge of and Ability to Apply Appropriate Adjustments

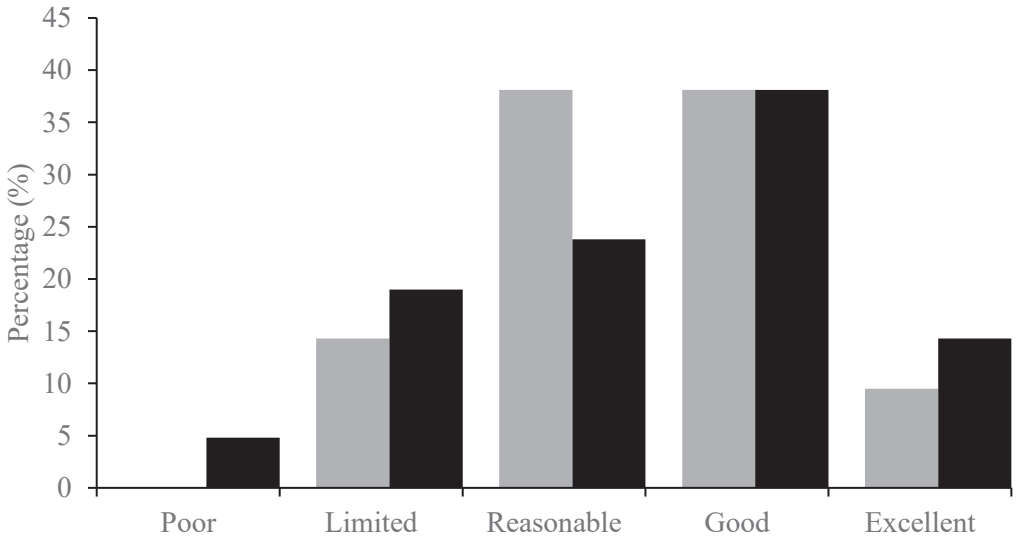
Self-reported knowledge. Using a five-point scale (1 = poor, 2 = limited, 3 = reasonable, 4 = good, 5 = excellent), participants (n=262) were asked to rate their ability to:

1. Recognise the language demands in their pedagogy
2. Use effective classroom adjustments for DLD

These domains are connected in that it is necessary for teachers to recognise the language demands in their teaching in order to make effective reasonable adjustments.

Figure B3

Self-rated Ability to Recognise Language Demands in Teaching and Ability to Use Appropriate Adjustments to Support DLD (n=262)



Knowledge application – scenario identification. The second task attempted to measure participants' ability to correctly interpret students' presenting characteristics. Participants were asked to apply their knowledge of learner characteristics through three scenario questions. Each scenario described a fictitious student and provided information about their learning, relationships and classroom engagement. Scenario 1 described a student with characteristics consistent with a Speech Sound Disorder (SSD), Scenario 2 described a student with characteristics consistent with Attention Deficit Hyperactivity Disorder (ADHD), and Scenario 3 described a student with characteristics consistent with Developmental Language Disorder (DLD).

Table B6

Participant Selection of Most Likely Source of Difficulty for each Scenario (n=21)

Primary characteristic impacting on learning:	Scenario 1 SSD	Scenario 2 ADHD	Scenario 3 DLD
Attention Deficit Hyperactivity Disorder (ADHD)	0 (0%)	3 (14.3%)	1 (4.8%)
Autism Spectrum Disorder (ASD)	0 (0%)	0 (0%)	1 (4.8%)
Childhood Complex Trauma	0 (0%)	2 (9.5%)	0 (0%)
English as an Additional Language/Dialect (EAL/D)	0 (0%)	10 (47.6%)	1 (4.8%)
Developmental Language Disorder (DLD)	16 (76.2%)	1 (4.8%)	5 (23.8%)
Hearing Impairment (HI)	0 (0%)	0 (0%)	0 (0%)
Intellectual Disability (ID)	0 (0%)	0 (0%)	1 (4.8%)
Learning difficulties	1 (4.8%)	4 (19.0%)	7 (33.3%)
Literacy difficulties	0 (0%)	1 (4.8%)	2 (9.5%)
Social/emotional difficulties	0 (0%)	0 (0%)	3 (14.3%)
Speech Sound Disorder (SSD)	4 (19.0%)	0 (0%)	0 (0%)

Knowledge application – adjustment selection. The third measure of teacher knowledge of appropriate adjustments asked participants to apply their knowledge by selecting adjustments for the students described in each of the three scenarios. Participants were provided with the most likely source of impact that they had chosen in the previous step (SSD, ADHD or DLD) and asked to choose the four most appropriate adjustments from a list of 12 possible adjustments. Table B7 outlines participant accuracy out of four for each scenario. Table B8 provides frequencies of adjustments selected.

Table B7

Accuracy selecting most helpful adjustments for each scenario (n=21)

Accuracy of selection	Scenario 1 SSD n (%)	Scenario 2 ADHD n (%)	Scenario 3 DLD n (%)
0 out of 4	0 (0)	0 (0)	2 (9.5)
1 out of 4	4 (19.0)	10 (47.6)	6 (28.6)
2 out of 4	11 (52.4)	7 (33.3)	10 (47.6)
3 out of 4	6 (28.6)	3 (14.3)	3 (14.3)
4 out of 4	0 (0)	1 (4.8)	0 (0)

Table B8

Comparison of Participant Adjustment Selection with Most Helpful Adjustments highlighted in Grey (n=21)

Selection of (4) most helpful adjustments	Scenario 1 SSD n	Scenario 2 ADHD n	Scenario 3 DLD n
Ask student to show what they mean (act out, use gesture, draw etc)	5	2	3
Behaviour plan	0	2	12
Cue attention to important information	4	15	5
Demonstrate learning through multiple modes (other than speaking/writing)	14	15	15
Explicit (oral) vocabulary teaching	8	10	9
Extra time to answer questions and share thinking	12	11	8
Monitor phonics and spelling development (provide more explicit teaching as needed)	14	10	4
Reduced curriculum expectations (reduced complexity of content)	3	4	8
Reiterate key points	1	7	4
Social skills sessions	3	1	5
Speech and/or language therapy (1:1 targeted intervention)	19	3	8
1:1 teacher aide time	1	4	3

RQ3. Influences on teacher knowledge

The final research question investigates factors that may influence teacher knowledge of the characteristics, educational impacts, and selection of adjustments for students with DLD. Data was gathered from NSW participants about years of experience, types of professional learning and speech pathology support. Due to the small numbers, no comparisons were calculated.

Years of experience

Table B9

Participant Years of Teaching Experience

	n (%)
0-2 years	3 (14.3%)
3-5 years	2 (9.5%)
6-10 years	1 (4.8%)
11-20 years	6 (28.6%)
More than 20 years	9 (42.9%)

Training. Participants were asked to indicate the training they had received on language development, disorder, links between language and literacy, and strategies to support students with language disorder.

Table B10

Experience of Professional Learning (n=262)

Training/professional learning in:	No	Yes *Initial teacher education*	Yes *Other professional learning*	Unsure
	n (%)	n (%)	n (%)	n (%)
Typical language development	9 (42.9)	3 (14.3)	9 (42.9)	0 (0)
Links between language and literacy	3 (14.3)	4 (19.0)	13 (61.9)	1 (4.8)
Language disorder	10 (47.6)	1 (4.8)	9 (42.9)	1 (4.8)
Strategies to support children with language disorders	11 (52.4)	1 (4.8)	9 (42.9)	0 (0)

Speech pathology support. Data about participants experience of speech pathology support was also gathered. One participant had never taught a student with DLD so was routed past the questions related to speech pathologist leaving 20 participants.

Table B11

Participant Experiences of Speech Pathology (SP) Support (n=20)

	Group	n (%)
No SP Support	Taught a student with DLD	10 (47.6)
SP Support Received	General SP support	0 (0)
	1 or 2 of the targeted supports	5 (23.8)
	3 or 4 of the targeted supports	5 (23.8)

The participants who had taught a student with DLD and had received support from a speech pathologist were asked to indicate what types of supports they had received and were able to select as many as applied from the 10 options provided.

Table B12

Types of SP support with targeted SP supports highlighted in grey (n=10)

Types of SP support:	**n**
Assessment of language skills (with report and/or feedback)	10
Classroom observation and advice on appropriate adjustments/classroom strategies	7
Demonstration of adjustments/strategies	6
Detailed outline of the student's communication skills or need	7
Identification of the language demands of the curriculum/classroom	5
Professional learning or training (formal or informal)	5
Program for you/another staff member to carry out	5
Setting language goals (e.g. IEP meeting or similar)	5
Speech pathology intervention – in the classroom	2
Speech pathology intervention – withdrawal from classroom/school	6