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OPENING THE DOORS OF POSSIBILITY FOR GIFTED/HIGH-ABILITY CHILDREN WITH LEARNING DIFFICULTIES: PRELIMINARY ASSESSMENT STRATEGIES FOR PRIMARY SCHOOL TEACHERS

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Abstract

The traits linked to gifted children with learning disabilities (twice-exceptional) are diverse and complex. Identification of these children can be hindered by a combination of factors, including variations in teacher knowledge and experience, inconsistencies in the visibility of high abilities coexisting simultaneously with one or more learning disabilities, and also the lack of a practical assessment tool. This mixed-methods study addresses the need for such a tool and other assessment strategies that primary school teachers can implement in the preliminary exploratory stage of identifying possible twice-exceptional children. In this process, the focus centres on learning strengths and difficulties.

The first phase of the Study focused on procedures leading to the development and trialling of a comprehensive and useful teacher checklist questionnaire (TCQ). Its comprehensiveness was developed through reviewing research-based characteristics, anecdotal lists and teacher perceptions. Section A of the TCQ is based on the six natural-ability Domains found in Françoys Gagné's Differentiated Model of Giftedness and Talent (DMGT 2.0; 2008) or, more recently, his Expanded Model of Talent Development (EMTD, 2013). Section B has three familiar categories of learning difficulties known within the context of the primary school. In the trialling phase, ten teacher participants trialled the TCQ and ranked the selected children in their classes on every item in the nine categories. Overall, qualitative and quantitative analyses suggest promising trends in the preliminary investigation into the TCQ's internal reliability, validity and practical usefulness.

In the second phase, six child participants were selected for case studies to determine whether other assessment strategies supported the findings of the TCQ. The results from Interviews with each child, a Parent/Teacher Questionnaire, a non-verbal intelligence test (Raven's Standard Progressive Matrices), and a Think-aloud protocol, affirm the worthiness of the TCQ, but variations in results suggest the importance of its inclusion as part of a comprehensive assessment protocol.

Candidate's Certification

I certify that the substance of this thesis has not already been submitted for any degree and is not currently being submitted for any other degree or qualification.

I certify that any help received in preparing this thesis and all sources used have been acknowledged in this thesis.

Signature

MaryAnne E Haines

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I dedicate this thesis to my beloved husband Frank Benson Haines, who was the wind beneath my sails and who always encouraged me to reach beyond the stars. I have sensed his loving presence many times and know that in spirit he has been very much part of the journey. I also honour Evelyn Howe PhD, inspirational colleague and very dear friend.

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List of abbreviations and acronyms

ACARA	The Australian Curriculum, Assessment and Reporting Authority;
CA	Content analysis;
Cth	Commonwealth of Australia;
DCA	Developmental Coordination Disorder;
DME	Dual and Multiple exceptionality;
DMGT 2.0	Differentiated Model of Giftedness and Talent (updated 2008), Gagné (2010);
EMTD	Expanded Model of Talent Development (EMTD), Gagné (2013);
FTE	Full time employment;
GLD	Gifted/high-ability learning disabilities;
JS1 and JS2	Job-share Teacher 1 and job-share Teacher 2;
TJS1 and TJS2	In Phase Two TJS1 refers to five teacher respondents (T) completing the Parent/Teacher Questionnaire together with job-share Teacher 1, and TJS2 represents the same group of five teachers and job-share Teacher 2;
LD	Learning disability/disabilities;
LDA	Learning Difficulties Australia;
LRC	Literature review conclusion/s;
MMR	Mixed Methods Research;
NAPLAN	National Assessment Program: Literacy and Numeracy;
OE	Overexcitabilities;
PAR	Participatory Action Research;
PTQ	Parent/Teacher Questionnaire (visual analogue scale);
SLD	Specific learning disabilities;
SPSS	IBM Statistics Pack for the Social Sciences, Version 23;
TCQ	Teacher Checklist Questionnaire (Likert scale);
TCQD	Teacher Checklist Questionnaire Development;
TCQT	Teacher Checklist Questionnaire Trial;
TPQ	Teacher Questionnaire: Perceptions about children who may be gifted with a learning difficulty (GLD) – also referred to as the Teacher Perceptions Questionnaire (TPQ);
2e	Twice exceptionality;
VAS	Visual Analogue Scale; and
WM	Working memory.

Glossary

Terms used in research often have multiple or even ambiguous meanings. I have listed the key terms and their definitions as used in this Study. Where further clarification is required, a more detailed explanation of the terms is included in the body of the thesis.

Anecdotal evidence: is based on personal observations and opinion (Stevenson, 2010) rather than directly citing primary sources. In the Study the use of the term also acknowledges that observations may be based on one or more primary sources, but are not cited.

Anecdotal list of characteristics: a list based on personal observations rather than on the findings of a systematic study (Stevenson, 2010).

Attention Deficit Hyperactivity Disorder (ADHD): is one of the most extensively studied learning disabilities and can coexist with intellectually gifted children (Foley Nicpon et al., 2011). The disorder manifests in varying degrees of severity both in cognition (for example, executive functioning, planning) (Foley Nicpon et al., 2011) and behaviourally (for example, hyperactivity, impulsivity) (Assouline & Whiteman, 2011; Montgomery, 2009). Where there is the absence of hyperactivity but still with the other difficulties associated with ADHD, the disorder is known as Attention Deficit Disorder.

Australian Curriculum, Assessment and Reporting Authority (ACARA): is responsible for the "development of national curriculum, administration of national assessments and associated reporting on schooling in Australia" (ACARA, 2016a, *Overview*). Whilst ACARA recommends implementation of its policies they are not mandatory.

Autism Spectrum Disorders (ASD): can have heterogeneous symptoms (Foley Nicpon et al., 2011) in children, including "specific difficulties and behavioural rituals that affect their social and communication skills and their perception, language and thinking" (Montgomery, 2009, pp. 282–283). Up to 10% of people with ASD may reveal a gift in a specific area such as mathematics, often being referred to as savants (Montgomery, 2011). On the ASD spectrum is Asperger's Syndrome typically manifesting in repetitive behaviours, literal interpretation of speech, and difficulties with motor control (Montgomery, 2009).

Cases: refer to *Units of analysis.*

Catholic Schools Office: monitors primary and secondary schools in a particular diocese.

Cognition: includes knowledge and understanding gained from mental processing of experiences and thinking.

Diocese: refers to a region including churches and schools under the leadership of a diocesan bishop.

Differentiation: programming in one or more curriculum subjects that adapts learning activities to cater for different ability or achievement levels of children, usually within the context of a class rather than through withdrawal for a special program.

Dual and multiple-exceptionality: also used synonymously with Gifted children with Learning Difficulties or Disabilities, and Twice-exceptionality.

Dyscalculia: difficulties associated with numeracy.

Dysgraphia: challenges with the coordination of handwriting.

Dyslexia: difficulties with using and working with written words in spelling, writing and reading.

Emotional Behavioural Disorder (EBD): can manifest as severe socio-affective issues, including difficulties with self-motivation, and problems with feelings of inefficacy caused by varying factors relevant to Gagné's Environmental catalysts (DMGT 2.0).

Empirical information: data obtained to address research questions or to "test hypotheses" (Punch, 2014, p. 5).

Evidence (or research) based: based on research findings (Stevenson, 2010).

Giftedness: high ability or high learning potential. The full definition is included in Chapter 2.

Gifted Learning Disability (GLD): a complex concept that encompasses high ability, simultaneously with one or more learning disabilities.

Individual Education Plan (IEP): consists of devised strategies to support the perceived learning needs and/or learning styles of a student. It can be used as basis for assessment and monitoring progress (Christle & Yell, 2010).

Individuals with Disabilities Education Improvement Act, 2004: represents reauthorised legislation in the United States, which although adding the word 'Improvement' is still known as IDEA (Smith, 2005). In this Act, 13 areas of disability are listed, 12 of which can coexist with cognitive/academic giftedness (Foley Nicpon, Allmon, Sieck & Stinson, 2011): Speech and Language Impairment, Hearing Impairment, Visual Impairment, Deaf-blindness, Developmental delay, Orthopedic Impairmant, Other Health Impairment, Autism Spectrum Disorders (ASD), Emotional Disturbance, Traumatic brain injury, Multiple disabilities, and Specific Learning Disability (SLD).

Intelligence quotient: is a score or measure of an individual's intelligence/reasoning ability obtained from specific standardised intelligence tests.

Learning difficulty: is a particular limitation/s to learning. The cause/s may or may not be influenced by a learning disability.

Learning disability: refers to one of a number of possible learning disorders that are often neurologically based and can manifest in learning difficulties.

Literacy: "Literacy is the ability to read and use written information and to write appropriately in a range of contexts to develop knowledge and understanding to achieve personal growth and to function effectively in our society. Literacy involves the integration of speaking, listening and critical thinking with reading and writing" (Department of Employment, Education and training, 1991, as cited in Board of Studies NSW English K-6 Syllabus, 2007, p. 5).

Metacognition: process of thinking about and regulating one's cognition to achieve an outcome.

Mathematics/Numeracy: "Mathematics provides students with essential mathematical skills and knowledge in *number and algebra, measurement and geometry*, and *statistics and probability*. It develops the numeracy capabilities that all students need in their personal, work and civic life, and provides the fundamentals on which mathematical specialties and professional applications of mathematics are built". (ACARA, n.d.-a).

NAPLAN (National Assessment Program – Literacy and Numeracy): is an annual assessment of Australian students in Years 3, 5, 7 and 9 (ACARA, 2012, *NAPLAN*, para.1)

On-line approach: is direct observation/assessment of the activity rather than a retrospective view.

Potential Plus UK: charitable organisation to support gifted/high-ability children and families in the United Kingdom (Potential Plus UK, 2014-2017).

Pre-service teachers: 'student teachers' at a university, involved in a teacher education program.

Primary school: in New South Wales, Australia, a primary school consists of seven year levels, Kindergarten to Year 6. Children in primary schools typically commence at 4 to 5 years of age and finish at 11 to 12 years. The use of the term *primary school* would be equivalent to elementary school.

Reliability: assessment of whether a scale or sub-scale "is free from random error" (Pallant, 2013, p. 6). Reliability is assessed by two main procedures, i) test-re-test and ii) internal consistency (scale reliability) (Field, 2013, Pallant, 2013).

Sensory integration difficulties: where the neurological processes involved in a range of activities such as reading or completing tasks, do not appear to be integrated.

Specific Learning Difficulty: according to the Individuals with Disabilities Education Improvement Act (IDEA, 2004, p. 13), includes children who have difficulties "in understanding or in using language, spoken or written, that may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations". Difficulties in literacy include the dilemma for a number of children in acquiring skills in both reading and spelling (dyslexia), handwriting (dysgraphia), and numeracy (dyscalculia). Baum and Owen (1988, cited in Rogers, 2012), estimated that 3–36% of the gifted may also have a disability in reading, writing or numeracy.

Stages in the primary school: There are four stages in the primary school in New South Wales, namely early Stage One which represents kindergarten, Stage One (Years 1 and 2), Stage Two (the middle-primary years of Years 3 and 4) and Stage Three (Years 5 and 6). A school Year in Australia is the term for Grade as used in some other countries.

Stanine score: refers to one of nine categories of percentile ranks. Numerals 1 to 9 "are used as category labels" with Stanine 9 being the highest score and Stanine 5 the "midpoint" (Australian Council for Educational Research, 2011).

Twice-exceptionality (2e): in the Study it is a term used for gifted children who simultaneously have exceptional ability and exceptional learning disabilities in one or more areas.

Underachievement: performance level that is not a true reflection of ability level.

Unit of analysis: a term used to denote what is being analysed or even who is being analysed (Babbie, 2011), which is often referred to as a case (Yin, 2003; Bazeley, 2013). In the Study's trialling of the Teacher Checklist Questionnaire the teachers' views are the units of analyses or cases, and the child participants who were the subjects of the views are the units of observation. In the Case studies the six child participants are referred to as cases because they directly provided data.

USA: United States of America

Visual processing difficulties: limitations to making sense of written text due to neurological processing difficulties via the sense of sight.

Validity: to what extent a scale (Teacher Checklist Questionnaire) measures what it has been designed to do (Pallant, 2013).

Table of Contents

Table of Figures

List of Tables

Chapter 1. Introduction

> "I often say that research is a way of finding out what you are going to do when you can't keep on doing what you are doing now" (Kettering, 1935, p. 1).

After teaching for many years in a primary school situated in a Diocese of New South Wales, Australia, I have often wondered about the progress of very able children who did not quite fit into the norm. These were children with the most extraordinary talents, such as eight-year-old Yvette who spoke of hearing music in her mind and could merge poetry into choral music and give performances akin to the outpouring of a well-played lute. Vanessa would mull for hours on a mathematical problem and then suddenly burst forth with a solution to her mother that was quite out of context within the aisles of a busy supermarket. There is also recall of other children, who at times showed remarkable ability and yet were constrained by the varying limitations of learning difficulties. One such child, Iain, portrayed visible signs of inefficacy and lack of self-motivation exacerbated by prolonged emotional challenges and underachievement. He despaired that he could not remember what he had read, and felt overwhelmed and anxious about this problem. The contradiction was that in spite of these difficulties, he could quite unexpectedly articulate insights at a depth well beyond his years. His struggle, together with learning difficulties faced by other very able children, have led to my quest to investigate ways of improving or enhancing the quality of their learning journey at primary school. My main goal is to develop a comprehensive and useful teacher checklist questionnaire for use in the primary school that would be a first step in opening the doors of possibility to greater understanding of such children's learning strengths and difficulties. The necessity for an assessment tool is urgent, not only for increasing the children's chance of accessing more support/meaningful learning opportunities, but for their self-actualisation, well-being, and hence for contribution to society as a whole. This quest coincided with a request by the Catholic Schools Office in the Diocese, for schools to determine children who may be very able but underachieving in literacy and numeracy.

1.1. Background and rationale of the study

One of the most exciting possibilities for gifted/high-ability children is that they have capacity to excel in any one or more fields of human endeavour, but the road to actualising this potential can be complicated, especially for a group of children whose giftedness or

high ability coexists with one or multiple learning disabilities. I refer to gifted or very able children as 'gifted/high ability' because this reference encompasses giftedness where there has been formal identification, and acknowledges children of high ability whose capabilities may not have been recognised. The combination of marked ability and disability has multiple references in the literature – including gifted with learning disabilities: GLD (Munro, 2002; Wormald, 2015), dual and multiple exceptionalities: DME (Montgomery, 2015) and twice-exceptionality (2e) (Neihart, 2008; Prior, 2013; Trail, 2011). A number of authors perceive that the abbreviations GLD and 2e are largely synonymous in terms of the coexistence of both giftedness/ high ability with learning disabilities (Foley Nicpon, Allmon, Sieck, & Stinson, 2011; Prior, 2013; Wormald, 2011b). From this perspective and with the more frequent reference to GLD in Australia at the commencement of the research in 2013, I referred to and used this term. However, over the four-year phase of the research there has been evidence suggesting that Australia is transitioning towards recognising this sub-population of gifted children with learning disabilities as twice-exceptional, as an alternative to GLD. This gradual change reflects international trends, as was noted in the recent World Council for Gifted and Talented Children Conference held in July 2017, where there was exclusive reference to 2e. The use of the term in Australia is prevalent in a number of educational government policies (refer to Section 2.3.6., Table 2.1), and of particular relevance, in online information provided for prospective parents/teachers by the Catholic Schools Office. The thesis is somewhat unusual, therefore, because it too has transitioned from GLD to 2e. However for consistency with reference to GLD in the early data collection phase, I use GLD (2e) particularly in the analyses and discussion.

The shift in focus to 2e is more than mere compliancy, but rather is in alignment with a rationale that recognises that the term best encompasses twice-exceptional children as firstly individuals, each one with a unique coexistence of giftedness/learning disability or marked learning strengths and difficulties (Prior, 2013; Ronksley-Pavia, 2015). Their multiple exceptionalities may seem disparate/separate, but these attributes interact and to varying degrees influence the expression of learning strengths and difficulties and, as such, are not independent or isolated (Assouline & Whiteman, 2011; Silverman, 2009a). In addition, the term 'twice-exceptionality' is an important reminder to educators that an inclusive educational approach that addresses both the child's strengths and their difficulties, is more conducive to their learning and well-being (Prior, 2013) than adherence to the not infrequent practice of focusing mainly on the problems. Silverman

(2009a) rightly refers to this practice as "deficit-based models of assessment and education" (p.169), which research shows can undermine self-efficacy and feelings of self-worth (Kauder, 2009; Neihart, 2008; Townend & Pendergast, 2015).

1.2. Exceptionalities

Acknowledging the transition to 2e gives rise to the need for clarification of the meaning of exceptionalities. In essence, 2e refers to both extraordinary ability in one or more areas of human endeavour (Gagné, 2010; VanTassel-Baska, 2000), and simultaneously to limitations or constraints to learning, arising from one or multiple learning disabilities (Nielsen, 2002; Prior, 2013). These learning disabilities or disorders are often associated with the complex phenomena of neurological processing disorders (Mercer, Jordan, Allsopp, & Mercer, 1996), the majority of which, apart from global disability, can coexist with giftedness (Foley-Nicpon, Assouline, & Colangelo, 2013) and be difficult to conceptualise and define (McCoach, Kehle, Bray, & Siegle, 2001), particularly in the absence of specialist assessment. In the United States of America the Individuals with Disabilities Education Improvement Act, 2004 (Smith, 2005), identifies 13 disabilities/disorders, 12 of which can coexist with giftedness – including physical and emotional disorders and the more commonly observed disorders in the school context, of Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD) and Specific Learning Disabilities (SLD) (Foley-Nicpon et al., 2013; Wormald, 2015). Further adding to the complex profiles of and difficulties for twice-exceptional children is that they may experience multiple learning disabilities known as comorbidity, and have "diverse behaviours and needs" (Reis, Baum, & Burke, 2014, p. 219). In spite of the consequent identification dilemma, the key observation that indicates that a gifted/high-ability child may have a learning disability is that there is usually a significant discrepancy between the child's ability and achievement levels (McCoach et al., 2001; Munro, 2002), which allowing for exceptions, does not appear to be the result of such factors as socio-economic and cultural expectations (Chaffey, Bailey, & Vine, 2015), and issues with educational provisions or health (McCoach et al., 2001).

The coexistence of giftedness/high ability, simultaneously with learning disabilities requires a practical consideration of how these needs are identified and addressed within the context of the primary school. As established, 2e goes beyond a dichotomous view; however, the associated learning strengths and difficulties, still need to be identified in

schools within the framework of available resources. This dual focus, whilst still recognising the interconnection of exceptionalities (giftedness and learning disabilities), enhances the possibility of accessing appropriate support for children's individual needs. In terms of the educational context of this Study, I will refer to three key terms:

i) twice-exceptionality – as the overarching concept;
ii) giftedness with learning disabilities – as the key feature of twice-exceptionality; and
iii) learning strengths and difficulties – as this Study's focus on assessment strategies in the preliminary stage of identifying possible twice-exceptionality.

1.2.1. Issues with definitions

As well as the complexity of the multiple concepts of 2e, the problem of identification is further exacerbated for teachers because there is no clear definition of how the different combinations of giftedness and disabilities actually manifest (Foley-Nicpon, Assouline, & Stinson, 2012; Ronksley-Pavia, 2015; Wormald, 2011a), although as Lovett & Sparks (2013) suggest, the sheer diversity can almost defy conceptualisation. One contributing problem to the definitional issue is the absence of a "universal definition of giftedness or system of identification" (Assouline & Whiteman, 2011, p. 381), a perception which is also supported by Ronksley-Pavia (2015) and Wormald, Vialle, and Rogers (2014). This dilemma is influenced by the fact that gifted children alone can have varying and complex rates of development (Munro, 2005b; Silverman, 2013). Furthermore, for teachers seeking to understand/identify the manifestation of one or more possible learning disabilities (LD), there remains inconsistency in terminology in Australia apropos of the interpretation of the term, particularly in its relationship to learning difficulties (Elkins, 2007). This observation is in spite of definitions in Australia's Disabilities Discrimination Act 1992 (DDA 1992), although they are broad in nature. (Refer to Chapter 2, Section 2.2.2.). There is also no consensual definition of learning difficulties (Twomey, 2006; Westwood, 2008), which can complicate the issue for primary school teachers seeking in the initial stage to identify and then "communicate on a common ground" limitations to learning that are manifesting in the possible 2e child (Ronksley-Pavia, 2015, p. 319). Learning difficulties can be defined generically as "academic and school-related problems" (Graham & Bailey, 2007, p. 386), particularly in relation to the development and application of skills in literacy and numeracy (Westwood, 2008). I feel this interpretation is meaningful within the school context, because it encompasses the causative internal and/or external factors

(Twomey, 2006) that contribute to difficulties in learning. In relation to 2e, internal factors include learning disabilities or disorders (Twomey, 2006), but may indeed reflect other factors such as a child's developmental stage, level of motivation, or self-efficacy. Of relevance too to education are the external factors such as the quality of educational provisions, which is critical for twice-exceptional children.

Reviewing these definitional dilemmas is essential because the Study seeks strategies for teachers at the school site to identify possible learning strengths and difficulties where there is no formal identification of 2e, or where teachers seek more knowledge about a child's learning profile. Whilst it does not aim to specifically identify giftedness or learning disabilities, familiarity with these concepts is integral to informing the identification process. The exploratory focus of the Study represents the initial or preliminary stage of research into 2e. Any marked learning strengths and difficulties may or may not indicate giftedness or learning disabilities or 2e but where evident, further investigation is warranted. In the case of marked learning disabilities, this identification/assessment may, subject to meeting necessary criteria, ultimately lead to government funding support, where available (Australian Government Department of Education and Training, 2017).

1.2.2. Obstacles to identification

One of the main limitations for teachers endeavouring to identify twice-exceptional children centres on the tendency for these children to elude recognition of both their true ability and the nature of their learning disabilities (LD). This elusiveness can hide a characteristic typical of gifted children, but even more pronounced in the twice-exceptional, and that is asynchrony – remarkable ability that is out of sync with norms for chronological age, but paradoxically also co-existing with one or multiple learning disabilities (Montgomery, 2009). As part of this complexity, the giftedness may be masked or hidden by the LD (McCoach et al., 2001; Munro, 2002; Reis & Renzulli, 2004) with challenging ramifications for teachers and parents/carers if the disabilities are accompanied by behavioural issues. In addition, the nature and extent of the learning disability can be difficult to detect because of the gifted child's capacity to compensate (Silverman, 2009b), resulting in average, seemingly non-concerning academic results. A further real concern arises where the compensation strategy that may have supported the child's journey in the early years of primary school, can decline in effectiveness as

curriculum demands increase (Silverman, 2009b). From my observations in the primary school, this tendency can manifest in the late primary, or as Ruban and Reis (2005) indicate, in the early to middle secondary-school years. The struggle for the twice-exceptional of working through the limitation of LD often results in underachievement (Clark, 2008; Hoover-Schultz, 2005; Montgomery, 2009; Rimm, 2008) and with it, as noted, the complexity of socio-emotional issues (Bandura, 1997; Montgomery, 2009; Reis & Renzulli, 2004; Rimm, 2008; Ronksley-Pavia & Townend, 2017).

1.2.3. Teacher knowledge, experience and lack of a preliminary assessment tool

From the school perspective, teachers face obstacles in addressing the needs of the twice-exceptional mainly associated with limitations in their knowledge or experience. It is estimated that gifted children with learning disabilities represent about 5% (Nielsen, 2002) or even up to 14% of the gifted population (Rogers, 2011a) and it is paramount that they are identified in schools as early as possible. However, the issues noted above regarding the complexities of 2e and the need for more clarification of definitions, in turn affect identification in the school context. This uncertain foundation contributes, in part, to limitations or variations in teacher understanding and awareness of 2e, as well as to uncertain attitudes about these children (Bianco, 2005; Carrington & Bailey, 2000; Crim, Hawkins, Ruban, & Johnson, 2008; McCoach & Siegle, 2007; Wormald, 2009). Coupled with these limitations, there is little if any assessment protocols to identify the multiple needs of twice-exceptional children in terms of both giftedness and learning disabilities (Assouline, Foley Nicpon, & Whiteman, 2010), a perception also observed by Wormald, Vialle, and Rogers (2014). From my observations as a primary school teacher, there is also no assessment tool or protocol to date available for teachers for the preliminary stage of investigating possible learning strengths and difficulties in primary school children.

In relation to the need for preliminary assessment strategies in schools, available literature outlines typical characteristics of 2e, which although being informative for teachers, have limited practical application in the classroom. These traits consisting of some research-based findings and/or anecdotes usually appear in lists (Bees, 2009; Montgomery, 2009; Nielsen, 2002), and less frequently, in a tabulated or checklist format (Rogers, 2012). These compilations are discussed in Chapter 2.

1.3. Significance of the Study

The complex profiles of 2e require on-going investigation to continue unravelling the complexities in order to address the need for meaningful intervention. Foley Nicpon, Allmon, Sieck, and Stinson (2011, p. 13) found "only 43 empirical studies" in the area of children who are twice-exceptional, in their review of 20 years of empirical research (1991 to 2011). Of these studies, few "examined twice-exceptionality from an empirically rigorous lens" (Foley Nicpon et al., 2011, p. 13). However, of particular concern is their finding that there was an absence of guidelines for systematic and sequential identification strategies and, identification strategies remain limited (Foley Nicpon et al., 2011). In spite of some further research in the field of 2e since 2011, for example, Dare and Nowicki (2015), Fugate, Zentall, and Gentry (2013), and Montgomery (2014), this gap is still to be addressed. The Study aims to offset the absence of guidelines and identification strategies and in the process ultimately inform professional practice for schools in the Diocese, as well as for my teacher colleagues and myself.

Foley Nicpon et al. (2011), together with Assouline et al. (2010), and Wormald et al. (2014) recommend that the identification process necessitates a comprehensive approach due to the diverse profiles of 2e. However, for teachers who may have undiagnosed gifted or twice-exceptional children in their class and are uncertain about the nature and extent of children's strengths and difficulties, there is a need for a school-based approach as a preliminary investigation. The Study consequently seeks to develop a preliminary assessment tool that is comprehensive, useful and also replicable. The successful development of such an assessment tool would be significant owing to the lack of and need for such a tool for use in the primary school.

Compounding the necessity for identification of twice-exceptional children in Australia, is Federal, State and Territory government policies that require that the needs of all children in primary- and secondary-school years are addressed in schools, which include 2e. ACARA (2016b) emphasises the importance of schools implementing strategies to support the needs of giftedness and LD. It recommends the use of an internationally and nationally accepted gifted model – 'Gagné's Differentiated Model of Giftedness and Talent (DMGT 2.0; 2008 update)' (Gagné, 2013) as a guide for school gifted education policies. In addition, ACARA (2016b, *Students with disability*) cites a mandate in the Disability Standards for Education 2005 (DSE) (Department of Education, Science and

Training, 2006), for all educators to provide equal access to curriculum, and recommends rigorous and relevant programs for students with learning disabilities. Although the DSE 2005 does not specify the range of disabilities or intervention strategies (Ronksley-Pavia, 2015) the recommendations and/or requirements that arise not only carry implications for educators but also add urgency to the need for rigorous, empirical research in Australia, into identification of the diversity of 2e. This Study is significant because it adds to that empirical research.

1.4. Purpose of the Study

The purpose of the Study is multifaceted. Firstly, as noted, it seeks to develop and trial a teacher checklist questionnaire for use in the preliminary stage of identification at the school site that would incorporate an accepted model of giftedness, and familiar categories of learning difficulties within the primary school context. In this process, the Study also aims to enhance teacher awareness of the diversity of 2e through professional development and involvement in development of the questionnaire, as well as in the consultation process regarding selection of child subjects and/or participants for the trialling phase. It is hoped that through teacher involvement, there may be a greater chance of detection of 2e, as well as other children needing modifications to professional practice, including curriculum programming. The domino effect that these ideals imply will not transpire, of course, without on-going professional development into the nature of 2e and teacher exposure to helpful strategies and effective management within the context of a classroom with mixed abilities and needs.

A further recommendation arising from Foley Nicpon et al.'s study (2011) was for research to include quantitative procedures to balance the predominance of qualitative studies. The present Study will utilise both qualitative and quantitative approaches via mixed-methods research methodology, which I feel will enhance the rigour of the investigation by utilising the advantages of both approaches and, in so doing, provide a stronger foundation to inform "educational practice" (Wheldall, 2010, p. 1). Additionally, multiple assessment strategies will be used for comparison to the findings of the questionnaire's trial. These mixed-methods procedures will include listening to the student voice, surveying parents and teachers, utilising a non-verbal intelligence test, that being the Raven's Standard Progressive Matrices, and incorporating an online or concurrent approach to determine critical-thinking skills and metacognitive abilities.

The Study, therefore, seeks to open doors of possibility, as far as possible, for children with possible 2e, by exploring assessment strategies for identifying their learning strengths and difficulties in the preliminary stage of the process. The desired identification outcome cannot be assumed to be prescriptive and it recognises each child's individuality, including self-motivation and the influence and nature of the learning difficulty and possible disability. If a child is detected for possible twice-exceptional traits on the assessment protocol, then where considered necessary and practicable, specialist assessment and/or learning support can be sought. However, of prime importance in the primary school is the greater chance of accessing more appropriate learning activities through differentiation of the curriculum and adjustments to teaching practice.

1.5. Summary of key definitions

Definitions of terms are in the Glossary but to provide re-clarification of the main terms used in the thesis, they are as follows:

Twice-exceptionality – an overarching concept and description of extraordinary ability coexisting with one or multiple learning disabilities. This term encompasses both giftedness with learning disabilities and the reality of the twice-exceptional as firstly individuals who experience the complex interaction of learning strengths and difficulties.

Gifted with learning disabilities – a key component of twice-exceptionality and are important foci for a school-based approach to address the needs of both attributes.

Learning strengths and difficulties – both terms used and relevant to the Study's focus on the preliminary stage of identification. Strengths may or may not reflect giftedness and learning difficulties may or not reflect disabilities, but where there are significant observations of either or both, further investigation would be warranted.

1.6. Structure of the thesis

Following on from this introductory chapter, the Literature review (Chapter 2) critically examines available primary and secondary sources related to a number of interrelated concepts influencing the identification of twice-exceptional children. It will identify key conclusions, which form the basis of the research questions, methodology, research designs, and procedural methods of data collection and analysis. Chapter 3 focuses on the

choice of methodology – Mixed Methods Research – and the research designs of Participatory Action Research (PAR) and case studies. The next three chapters (Chapters 4, 5 and 6) centre on the first phase of the Study associated with PAR – and include methods of developing and trialling a teacher checklist questionnaire and the results/analyses of its trialling, including discussion. Owing to the multiple sections and range of data, discussion occurs after each main section in these chapters to enhance comprehensibility, rather than appearing as a separate chapter. The second phase, Case studies, commences with Chapter 7, outlining the methods involved, followed by Chapters 8 and 9 that both analyse and discuss results in relation to the findings of Phase One. The Conclusion in Chapter 10 reviews the key findings and limitations, which both lead to recommendations for future research and implications for primary school and teacher practice.

Chapter 2. Literature Review

> We are like dwarfs sitting on the shoulders of giants, so that we can see more than they, and things at a greater distance, not by virtue of any sharpness of sight on our part, or any physical distinction, but because we are carried high and raised up by their giant size (attributed to Bernard of Chartres, as cited in Merton, 1965).

2.1. Introduction

The purpose of the research is to enhance learning opportunities for twice-exceptional children – by utilising assessment strategies that can be accessed and implemented by classroom teachers for identifying learning strengths and difficulties in the preliminary stage of determining giftedness/high ability with learning disabilities. The use of the terms 'learning disabilities' and 'learning difficulties' is reviewed in Section 2.2.2. The term twice-exceptionality (2e) or giftedness with learning disabilities (GLD) (Wormald, 2015), or dual and multiple exceptionality (Montgomery, 2015), is associated with gifted children who experience learning needs ranging across both ends of the spectrum. For the Study, any of these terms would have been relevant, but as explained in Chapter 1, I transitioned to using 2e, because I felt it encapsulated the uniqueness of each child rather than purely focusing on the "disparate concepts" of giftedness and learning difficulties (Assouline & Whiteman, 2011, p. 381). This term is also in alignment with trends both nationally and internationally.

Connected to 2e, is a multitude of interconnected concepts and related sub-concepts. Consequently, available relevant literature has been examined for insight on these concepts, and provides the basis for the following review. The chapter is in three main sections including:

1. identification of twice-exceptionality;
2. other strategies for the classroom teacher; and
3. summary and conclusion.

Section 1 commences with the fundamental issue affecting the identification of possible 2e, which is the need for a consensual definition about giftedness, learning disabilities and, of particular focus, 2e. After establishing the issues at the foundational, definitional level, further obstacles that compound the difficulty of identification are reviewed, namely

the paucity of empirical research, the extraordinary range and combination of twice-exceptional traits, the controversial area of underachievement, the Intelligence Quotient debate, and variations in teacher awareness and knowledge. To emphasise the need to pursue effective identification, in spite of these limitations, attention is given to policy requirements stipulated by Australian government education agencies. To further justify the need for the Study, available identification screeners/checklists, and lists of perceived typical traits of 2e are critiqued for their suitability for use by primary school teachers in the preliminary identification process, and to determine whether they are based on recognised models for their gifted categories.

Section 2 addresses key concepts connected to the question of other assessment strategies that may support the identification process, particularly for comparison purposes. Literature is explored and discussed in relation to the value of i) listening to the student voice, ii) the use of accessible non-verbal intelligence testing, iii) consulting with parents/caregivers, and iv) utilising an online/concurrent approach for evaluating metacognitive capacity and critical thinking.

For the first two sections of the chapter, diagrams are included, to show how the 'pieces' progressively fit together (adapted from Cornish, 2012) for the purpose of building and establishing the case for the Study. In addition to this building process in the Literature Review, Section 3 summarises the key findings and concludes with two key questions that drive the Study.

2.2. Section 1: Identification of twice-exceptionality – What's all the fuss?

A review of definitions is essential because lack of consensus limits the chance of twice-exceptional children being both identified and receiving appropriate educational intervention in the school system (Wormald, 2011c). The current understanding and definitions of giftedness, learning disabilities and difficulties, and gifted with learning disabilities and difficulties (Figure 2.1) are varied and the review will determine whether it is possible to put forward a clear definition so that teachers can at least have a foundation on which to base their observations. Although this three-pronged approach suggests disparateness, it is stipulated that this is merely to focus more thoroughly on the aspects of what represents the whole twice-exceptional child. This approach also has meaning in

current educational practice that ideally endeavours to enhance strengths and support the difficulties.

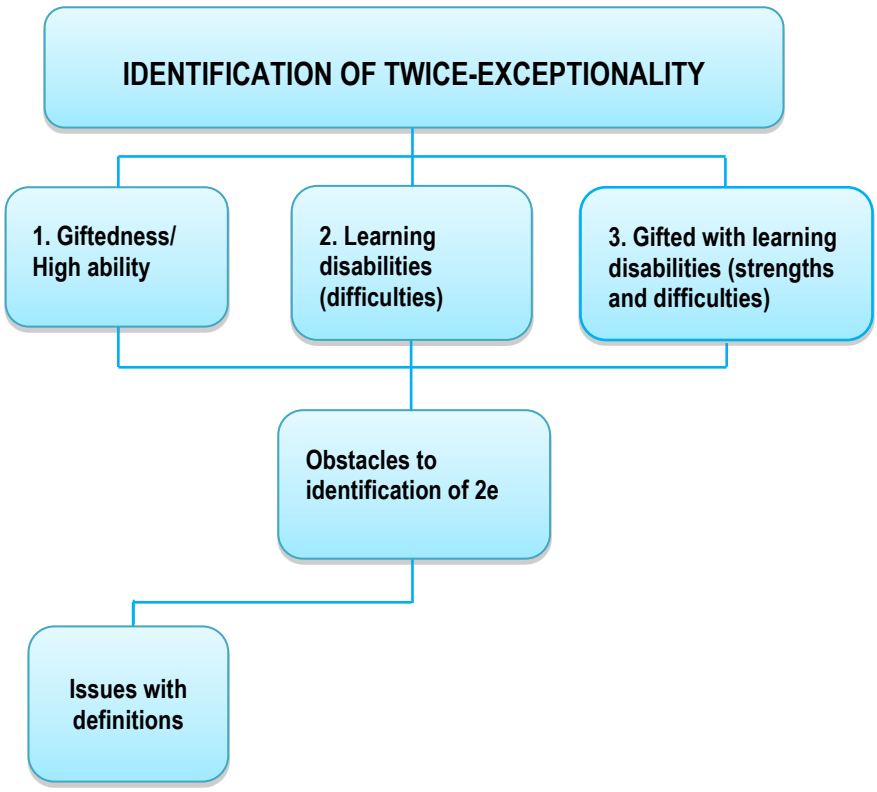

Figure 2.1: Diagram – definitions and issues
Note. Inclusion of 'difficulties' in parentheses in Point 2 and 'strengths and difficulties' in Point 3 refer to the Study's specific focus

2.2.1. Giftedness

> "A gifted pupil is one who can benefit from a gifted education programme. Fly the flag and see who salutes" (Geake, 2009, p. 81).

Internationally, the term 'gifted' continues to be characterised by multiple definitions that mainly centre on very high potential, and depending on the influence of one or more "catalytic variables" (Gross, Macleod, Drummond, & Merrick, 2003, p. 6), transformation into remarkable talent to a level that goes well beyond what would be deemed, in the case of primary school children, as typical of their chronological age. The New South Wales, Department of Education and Training, adopted definitions in 2004 based on Gagné's Differentiated Model of Giftedness and Talent Gifted (DMGT), presumably 2004, (Gagné, 2004), although the document refers to 2003. This policy states that gifted students "are those whose potential is distinctly above average in one or more of the following domains of human ability: intellectual, creative, social and physical", and talented students have skills "distinctly above average in one or more areas of human performance " (NSW

Department of Education and Training [NSW DET], 2004, *Definitions*, p. 6). Gagné's model has undergone further modifications since then and his DMGT 2.0 (2008 update) indicates giftedness in both potential and talent as representing the higher range of at least 10% of the population (Gagné, 2008). He defines giftedness as "the possession and use of untrained and spontaneously expressed outstanding natural abilities or aptitudes (called gifts) in at least one ability domain, to a degree that places an individual at least among the top 10% of age peers" (Gagné, 2010, p. 82). 'Talent' he sees as advanced accomplishment, or performance, in at least one area that would fall within the top 10% of age peers (Gagné, 2008). These figures can vary, with Renzulli (2002, p. 71) estimating that exceptional performance would feature in the "top 15 to 20%" of any field. Whilst these estimations tend to suggest that giftedness can feature in the 80th to 90th percentile, which is a finding also supported by Bannister-Tyrrell (2013) in her study of possible-talented and talented primary school readers, Gagné (2008, p. 5) cautions about being too focused on specific number representations: "The 'how many' question has no absolute answer, nowhere will we find a magical number that automatically separates those labelled gifted or talented from the rest of the population". To further support his claim, he points out that as the six domains are not strongly correlated, interpretation of giftedness in any one domain compared to another, will be different and consequently the total gifted population overall is likely to substantially exceed the 10% noted in the DMGT 2.0 (Gagné, 2008). Gagné's inclusion of multiple areas of exceptional potential/ability is supported by ACARA (n.d.-b, *Introduction*, para. 2), stating that gifted and talented students "may demonstrate gifts and talents in a single area or across a variety of domains".

This potential/possibility focus of giftedness has echoes of the nature/nurture debate where it has been established that there are genetic influences on high potential (Gagné, 2013). Geake (2009, p. 261) found that from a neurophysiological perspective, images of the pre-frontal cortex in the brain of gifted individuals are different, showing "enhanced frontal cortical activation and inter-hemispheric functional connectivity". Gagné (2013) points out, though, that this does not imply an innate static ability or a fixed blueprint, or what VanTassel-Baska (2000, p. 3) refers to as "crystallized abilities", but rather that this ability is developmental, fluid and has the potential to unfold through interaction with environmental influences. This broader nature/nurture view is echoed by Flynn (2007, p. 53), who postulates that a combination of factors compass intelligence, which are relevant across cultures and include: i)"mental acuity", ii) knowledge/information, iii) "Speed of

information processing", iv) memory in recalling information, v) " Habits of mind", and vi) individual "Attitudes".

The developmental and performance aspects of giftedness are supported by Subotnik, Olszewski-Kubilius, and Worrell (2011, p. 7) who consider that in early childhood, "potential is the key variable; in later stages, achievement is the measure of giftedness; and in fully developed talents eminence is the basis". The idea of achievement as a measure of giftedness rings true to Sternberg, Jarvin, and Grigorenko (2011), who claim that productivity is the key determinant of giftedness rather than the traditional perspective of an exceptional intelligence quotient (IQ). Sternberg and Grigorenko (2002, p. 276) emphasise that "High intellectual abilities, in and of themselves, seem inadequate as a basis for giftedness because so many people with such abilities squander them and, therefore, do not … deserve the label of gifted". Furthermore, of particular relevance to twice-exceptional children, giftedness is associated with the attributes of marked asynchronous development both internally, that is, being cognitively and emotionally out of sync with chronological years, as well as externally in terms of "societal norms" (Silverman, 2009b, p. 116).

Transformation of potential into actuality is influenced by internal and external factors/catalysts (Gagné, 2009, 2010; Montgomery, 2009). The New South Wales Department of Education and Training Curriculum K-12 Directorate (2004, *Definitions*, p. 6, para. 3) goes further by stating that environmental and intra-personal factors (representing the 'I' catalyst of the DMGT 2.0) can hinder or assist not only talent development, but of particular relevance to the Study "the recognition of giftedness". Examples of environmental or external factors can include cultural background, socio-economic status and quality of teaching (Montgomery, 2009). Of further relevance is that intra-personal or internal catalysts can incorporate motivation, personality (Borghans, Golsteyn, Heckman, & Humphries, 2016; Montgomery, 2009), self-esteem and the limiting factor of "learning difficulties" (NSW DET, 2004, *Definitions*, para. 3). In relation to personality, Borghans, Golsteyn, Heckman, and Humphries (2016, p. 13358) found that this intrapersonal factor predicted "achievement test scores and grades above and beyond IQ scores" in their analysis of four datasets, two of which included measures of achievement, grades and personality in a group of "Dutch high school" students, as well as academic achievement, and income and "life satisfaction" in an American study – The National Longitudinal Survey of Youth. Although the authors conceded that some data did

not have complete information, they felt that there was still sufficient to substantiate this key finding.

To consider the implications of the above review of giftedness for educational policy in Australia, a recent review of all the six States' and two Territories' policies (Table 2.2) appears to show consensus in approval of Gagné's DMGT 2.0 as a workable basis for the educational context. Furthermore, ACARA (n.d.-b, *Gagné's model,* para. 1), whilst acknowledging that there is "no universally accepted definition" of giftedness and talent, recommends Gagné's model as providing the "most generally accepted definition". Without exception, acceptance is given in all of these cited documents to giftedness being understood as high potential, and talent as outstanding natural abilities or aptitudes in one or more domains/areas of endeavour. A more detailed review of Gagné's model occurs in Section 2.5.3. The particular relevance to the Study of referring to Australian educational policies is that because Gagné's model is generally given national acceptance, identification and intervention strategies that are conducive to policy understanding are expected.

To summarise, definitions of giftedness tend to focus on extraordinary potential, which through interaction with a range of factors, can lead if nurtured into remarkable achievement. The intrapersonal factor of learning difficulties can limit the development of giftedness into talent and limit the recognition of giftedness. Current educational policy throughout Australia acknowledges Gagné's DMGT 2.0 as a workable framework for gifted curriculum development. However, although definitions seem to lead to a common understanding sufficient for identification purposes, there are issues limiting a universal perspective.

2.2.1.1. Issues with definition of giftedness

As important and seemingly comprehensible as the perspective of outstanding ability and talents is to understanding of giftedness, the concept is still fraught with complexity, evidenced by the variations amongst gifted children (VanTassel-Baska, 2000) and the multitude of causal factors/catalysts impinging upon development (Clark, 2008; Gagné, 2009). VanTassel-Baska (2000) points out that the profiles of gifted and talented students are diverse and achievement can be markedly different even in the same area of observation. To support this view, she cites that in her role as director of the talent search program at Northwestern University, teachers' observations of seventh graders indicate

that variation could be as much as "three standard deviations in respect to mental functioning in one or more areas" (p. 2). This mixed typology is also noted by ACARA (2016b, *Gifted and talented students*). Baum and Owen (2004) add that not only can there be variations in strengths, but gifted children can still experience challenges academically and not necessarily be seen as having learning difficulties. For instance, in a study by Clemons (2008, p. v), involving a non-probability sample of 369 Year 7 to Year 9 gifted students from schools in three American states, it was found that their "socioeconomic status was found to have the strongest relationship with academic achievement followed by achievement motivation, study and organizational skills, and parental involvement and responsiveness". Whilst these perceptions suggest caution in not over-interpreting glitches in learning, the concerns regarding possible learning difficulties cannot be dismissed. The following section reviews the existing confusion about the use of the terms 'learning difficulties' and 'learning disabilities'.

2.2.2. Learning difficulties, or are they disabilities, or vice versa?

The definition and application of learning difficulties and learning disabilities contribute another dilemma for teachers in identifying twice-exceptional children. What do the terms refer to, what is the difference and at what point is the difficulty considered to reflect a learning disability? In Australia, in spite of the mandatory DSE 2005 (Department of Education Science and Training, 2006), there is still variation in how the two terms are defined, which suggests the need for further clarification. The DSE 2005, based on the DDA 1992, lists multiple broad meanings associated with the term 'learning disability' and states the associated requirements to be observed by all "education providers" (Department of Education, Science and Training, 2006, p. 7). Although the DSE 2005 does not specify the learning disabilities (LD) that can coexist in children of high ability/giftedness, such as found in the Individuals with Disabilities Education Improvement Act, 2004 (Smith, 2005) in the USA, the most relevant for considerations of 2e include: "disability, in relation to a person, means –

> (f) a disorder, or malfunction that results in the person learning differently from a person without the disorder or malfunction; or

> (g) a disorder, illness or disease that affects a person's thought processes, perception of reality, emotions or judgment or that results in disturbed behaviour" (Department of Education, Science and Training, 2006, p. 7).

ACARA (n.d.-b, *Introduction,* para. 2) offers further clarification for twice-exceptional students, in their qualification that LD can coexist with giftedness. However, this statement is also not specific about the types of LD, which although not within the advisory role of ACARA, would be more meaningful for teachers if there was further elaboration in the DDA 1992.

The key significance of the DSE 2005 (Department of Education, Science and Training, 2006, p. 11), in relation to the DDA 1992 centres on the term "on the same basis" and mandates that students with LD have access to the same rights as students without LD. These rights include equality in i) application for admission into educational institutions, ii) provisions received by education providers, and iii) participation in programs, allowing, of course, for adjustments to meet the needs of the disability (Department of Education, Science and Training, 2006, p. 9). To ensure compliance with the DDA 1992 and the DSE 2005, in terms of education "on the same basis" for students with learning disabilities, the Nationally Consistent Collection of Data on School Students with Disability was established in 2013. It is an annual collection of "the number of school students with disability and the level of reasonable educational adjustment they are provided with" including each child's most impacting disability (Australian Government Department of Education and Training , 2017, para. 1). The data obtained assist schools in reviewing identification and best practice, as well as meeting the need for legal accountability and, ideally, accessing governmental funding allocations for LD. Whilst these allocations sound promising, for 2e children it would be difficult to individually access specific financial support unless there were major impediments to learning, such as physical limitations. However, where schools are aware of children with diagnosed or suspected learning disabilities, they are, in accordance with the DDA 1992, legally protected against any discrimination. Although the DDA does not specify medical diagnoses, to meet the NSW Department of Education and Training Disability Criteria requires specialist assessment, and in cases where this is not possible, then consultation with DET special coordinators may suffice (NSW Department of Education and Training, May 2003).

Whilst acknowledging that Australia has mandatory policies for learning disabilities, the question still remains about the use of the two terms 'learning disability' and 'learning

difficulties', which has implications for identification. The potential confusion for teachers is reflected by the findings of an Australian Taskforce on students with learning difficulties, that "Nationally and internationally, learning disability, specific learning disability, learning difficulty and to a lesser extent learning disorder and learning difference are used to describe the same things and also different things" (Australian Capital Territory Education and Training Directorate, 2013, p. 1). The Taskforce also points out that whilst the DSE 2005 (Department of Education, Science and Training, 2006, *Part 2,* 2. 2) outlines various perceived disabilities, there is not a clear definition of disability, which as noted above, is likely to be related to the broad nature of the definitions in the DDA 1992. Clarification of the most appropriate use of terminology would seem to be important for teachers as a basis for seeking to i) comprehend and articulate learning disabilities/learning difficulties, ii) interpret the above legislative documentation, and iii) implement preliminary assessment strategies, which ultimately may justify or necessitate formal diagnoses where applicable.

Besides the broad definitions of DDA 1992, the NSW Government Department of Education (2007, *Statement 1.1*) states in equally general terms: "In any one school there will be students who may experience difficulties with learning. These difficulties may vary in cause, nature, intensity and duration". No specification is given about the causes but these are likely to involve internal and external factors (Learning Difficulties Australia, 2016; Montgomery, 2009; NSW DET, 2004; Twomey, 2006) which are reviewed in Section 2.3.3 and 2.3.3.1. From the above review unless there is formal identification or multiple, informed non-medical views suggesting LD (the latter which may be influenced by school location, cultural and socio-economic factors), Elkin's perspective that learning difficulties tends to "cover all students with high incidence educational problems" is realistic (Elkins, 2000, p. 5).

The varied perceptions suggest the need for further definitional precision and detail at policy level, but regardless, the need for determining whether difficulties exist with high ability/giftedness is essential on two levels — to determine the possible nature of the difficulties for appropriate intervention, and to review whether these difficulties do indeed reflect learning disabilities. To meet the mandate for equity "on the same basis" (Department of Education, Science and Training, 2006), a preliminary assessment protocol for teachers is essential, which includes familiar categories of learning difficulties

in the school context, as well as categories of giftedness/ high ability for twice-exceptional children. The following section reviews current perceptions of 2e.

2.2.3. Twice-exceptionality

> Twice exceptional individuals evidence exceptional ability and disability, which results in a unique set of circumstances. Their exceptional ability may dominate, hiding their disability; their disability may dominate, hiding their exceptional ability; each may mask the other so that neither is recognized or addressed. National Twice-Exceptional Community of Practice (2014) cited in Baldwin, Baum, Pereles, & Hughes (2015, p. 212)

With the definitional and terminological issues connected to giftedness (Carman, 2013) and also to learning difficulties and learning disabilities (LD), it is not surprising that there is lack of an international and national consensual definition of 2e (Reis et al., 2014; Wormald, 2011c), although there is a general understanding of the discrepancies or contradictions, as evidenced by the national definition of 2e in the USA (cited above) (Baldwin et al., 2015). Reis et al. (2014, p. 222), whilst seeming to concur with this view, broaden their definition to include children who have significant potential "in one or more domains such as math, science, the social arts, the visual, spatial, or performing arts or other areas of human productivity and who manifest one or more disabilities…". This interpretation would marry with the multiple domains of Gagné's DMGT 2.0 and is important for the consideration of 2e in the school setting.

To obtain a clearer picture of the size of the twice-exceptional population, there are various estimates, which tend to be similar. Potential Plus UK (2014–2017), estimate that there are about 5 to 10% of gifted children who have SEN (Specific Educational Needs), whereas 2–5% of SEN are of gifted ability. The term SEN is used in the United Kingdom. From an extensive study (Project 2 Excel) by Rogers (2011a) of 504 gifted and talented children in four school districts in the United States, it was estimated that 14% were 2e. Compared to the general population the figure is estimated to be approximately 4%, the difference which from an educational perspective, appears to be inexplicable (Wormald, 2015). The figures, overall, indicate that in a primary school, mixed-ability class of 20 to 30 children, there is a possibility that at least one child may be gifted and/or have high ability in one or more fields and simultaneously have LD.

2.3. Further obstacles to identification of twice-exceptionality

The following section reviews further challenges for teachers endeavouring to gain insight into the traits of 2e. Figure 2.2 illustrates the multiple obstacles of lack of empirical research, the diverse and complex nature of 2e, the issues involved with underachievement and intelligence quotient testing, and the question of teacher awareness and experience.

2.3.1. Question of empirical research?

> Rhetoric appears to have replaced reason and assertion appears to have replaced the need for empirical fact. It is apparent to almost everyone, except to many educational researchers themselves, that much contemporary educational research has little relevance to, or has little potential to inform, educational practice (Wheldall, 2010, p. 1).

Compounding the problem of identification is that in spite of increased studies in 2e, particularly in the area of giftedness with Specific Learning Disabilities (SLD) (Foley Nicpon et al., 2011), there remains an urgent need for more rigorous empirical research (Wormald, 2011). Wheldall (2010, p. 1) argues that not only is empirical research essential, but where possible the incorporation of "experimental, educational psychological research" best supports progress. Foley Nicpon et al. (2011) found evidence to validate the urgent need for empirical research from her review of 20 years of research in the area of 2e focusing on three learning disabilities which can coexist with giftedness, namely Specific Learning Disabilities (SLD), Attention Deficit Hyperactivity Disorder (ADHD) and Autism Spectrum Disorders (ASD). The authors clearly outline their methodology including searching the databases of PsycINFO and ERIC, and the results and findings indicate that whilst the existence of 2e is supported, there is a deficit in empirically rigorous research and an urgent need for "additional quantitative analyses that offer evidence for the effective identification and treatment of twice-exceptionality" (p. 13). Lack of research is also noted by (Gilger & Hynd, 2008, p. 215) who go further in their claim that paucity of both empirical research and neuroscientific study in 2e has been influenced by a focus on the construct as a "disease" or "disorder", which they suggest is "in part due to some long-standing traditions in … child development and the funding focus or preference that adopted the 'disease model' of abnormal learning in certain populations of children"

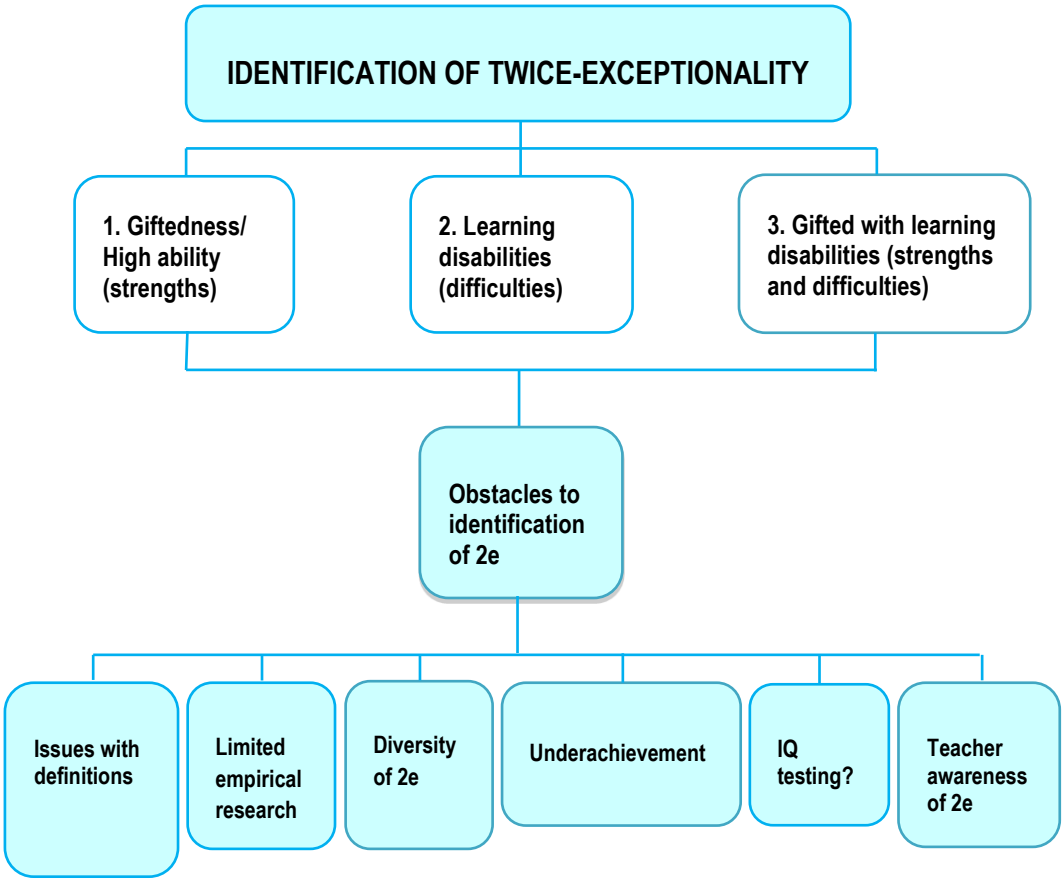

Figure 2.2: Diagram of obstacles to identification of twice-exceptionality
Note: Aqua highlight = concepts under focus; Under concepts 1 to 3, 'strengths' and 'difficulties' have been included to indicate the focus of the research

2.3.2. The diversity of twice-exceptionality

One of the key problems connected to identifying gifted children is the range and complexity of needs, which may or may not be readily identifiable. According to Wormald (2015, para. 2), the most "significant feature of a GLD child is uneven or inconsistent academic performance, which is unexplained and unpredictable". Compounding this problem is the lack of consensus about "the best means for identification of these twice-exceptional children" as evidenced by the challenges in identifying "nonverbal disabilities", and some "cognitive processing disabilities" (Ruban & Reis, 2005, pp. 120-121). Montgomery (2009, p. 11) also draws attention to the spectrum of needs in LD, with each having "a continuum of difficulty from mild through moderate and severe to profound". Additionally, twice-exceptional children's true ability and even some learning disabilities can be masked (Davis & Rimm, 2004; Krochak & Ryan, 2007). To illustrate the phenomenon of masking, including the tendency to compensate for any weakness, van Viersen, Kroesbergen, Slot, and de Bree (2016) found

in their study of 121 Dutch primary school children consisting of i) dyslexic children, ii) children without formal identification of being gifted or dyslexic, and iii) gifted children with dyslexia, that gifted children with dyslexia were able to compensate for difficulties in phonology by their abilities in vocabulary, working memory (WM) and grammar. For example, gifted children with dyslexia scored similarly to gifted children, but outperformed the other two groups in vocabulary and WM. These authors referred to abilities in WM, but this construct, as well as processing speed, can be problematic for some 2e children (Foley Nicpon et al., 2011). One of the problems with masking and/or compensation is that the child may not receive the necessary educational support in either the learning disability or the gift and particularly so if the most obvious need is in LD (Ruban & Reis, 2005).

Clarification is required with regards to what the literature regards as typical traits of giftedness with learning disabilities. Interestingly, Nielsen (2002, p. 95) noted that in the files of over 300 diagnosed twice-exceptional children, "twice-exceptional students contained twice as many references to disability-related characteristics than to those associated with giftedness". This finding may reflect, in part, the unidentified, perhaps masked traits of giftedness, but it would be more likely to be an indication of the multiple and often more confronting issues evident in each of the designated categories of learning disabilities. Traits of giftedness that have been observed in 2e children include:

- abstract thinking and problem solving (Nielsen, 2002; Pfeiffer, 2011; Reis, 1989; Renzulli, 2005);
- high ability in one or more areas (Foley-Nicpon, Assouline, & Fosenburg, 2015; Nielsen, 2002);
- in-depth knowledge (Nielsen, 2002);
- advanced vocabulary and articulateness (Nielsen, 2002; Pfeiffer, 2011);
- in-depth questioning (Montgomery, 2009);
- grasping concepts all at once (Nielsen, 2002);
- unique or quirky sense of humour (Nielsen, 2002);
- high level of creativity (Nielsen, 2002); and
- advanced metacognitive knowledge and/or skills and/or behaviours (Alexander, Carr, & Schwanenflugel, 1995; Bannister-Tyrrell, 2013; Hannah & Shore, 2008).

Anecdotal traits (or from unspecified sources) typically include:

- ease of mastering new concepts (Montgomery, 2009, 2015);
- prowess in solving puzzles (Bees, 2009);
- excellent visual memory (Bees, 2009; Potential Plus UK, 2014–2017);
- exceptional social traits, for example, leadership, persuasiveness, empathy (Gagné, 2008, 2010);
- keen perceptual characteristics, for example, sound and taste sensitivities (Gagné, 2008, 2010) and in-depth level of perception (Montgomery, 2009); and
- exceptional physical traits involving gross motor and fine motor skills (Gagné, 2008, 2010).

Evidence-based learning difficulties involve:

1. *Academic issues*
    - demonstrating a significant gap between verbal ability and written expression (Montgomery, 2009; Assouline et al., 2010);
    - handwriting coordination and issues with paper and pencil tasks (Montgomery, 2009);
    - problems with completing tasks (Montgomery, 2009);
    - problems with spelling, including phonics (Montgomery, 2009);
    - inconsistent academic skills (Nielsen, 2002);
    - concentration issues (Nielsen, 2002);
    - being distractible (Nielsen, 2002); and
    - remembering and following verbal directions (Nielsen, 2002).
2. *Socio-emotional issues*
    - feelings of academic inadequacy (Neihart & Betts, 2010; Rimm, 2008);
    - sensitivity to criticism (Schiff, Kaufman, & Kaufman, 1981);
    - poor self-esteem and inappropriate social interactions (Nielsen, 2002; Whitmore, 1980);
    - isolation from peers and issues with working in groups (Nielsen, 2002); and
    - unrealistic self-expectation (Silverman, 1989).
3. *Further issues*
    - self-organisation (Nielsen, 2002);
    - impulsiveness (Nielsen, 2002);
    - indifference to school and related work (Nielsen, 2002);

- behaviour (Nielsen, 2002);
- fine motor coordination (Nielsen, 2002); and
- coping with change of routine (Nielsen, 2002).

Most of these LD traits are referred to anecdotally by Bees (2009), Potential Plus UK (2014-2017) and Whitmore (1980).

To summarise, the traits for 2e are varied and include a number that are based on the research of a limited number of authors. Anecdotal references are more extensive. Obstacles are prevalent in the identification of these traits.

2.3.2.1. Comorbidity

As well as the diversity of twice-exceptional traits, there is another component which adds to the difficulty of identification and associated issues, and that is comorbidity. This term refers to multiple LD that can coexist with giftedness (Reis et al., 2014). For instance, for the heterogeneous sub-population of children with Attention Deficit Hyperactivity Disorder (ADHD), which is noted by Montgomery (2015) as one of the most prevalent childhood disabilities/disorders, Filmer (2011, p. 127) indicates they can also have dyslexia, and this comorbidity can range "from 24% to as much as 70%". However, whilst the author has not included the source of these figures, a study of 40 diagnosed ADHD children between the ages of 9 and 12 years, who attended a "child and adolescent mental health service (CAMHS)" presumably in Ireland, found 70% comorbidity with "both receptive and expressive language difficulties" (Walsh, Scullion, Burns, MacEvilly, & Brosnan, 2014, p. 59). It is important to note that comorbid symptoms are not always specific to LD, and in the case of gifted/ADHD, Foley Nicpon et al. (2011) caution that exhibited symptoms may be indicative of both the giftedness and/or the ADHD.

2.3.2.2. Deleterious impact on well being

One of the main reasons for the need for identification is the concern of mental health issues exacerbated by the negative impact on self-esteem and self-efficacy. In his social cognitive theory, Bandura refers to the importance of self-efficacy, or self-belief in one's own capabilities, in empowering "self-regulatory skills" and learning potential (Bandura, 1993, p. 136). Lack of identification of true ability, and underachievement, are likely to lead to poor self-concept (Ronksley-Pavia & Townend, 2017) and inhibit cognitive functioning (Bandura, 1997). Neihart and Betts (2010) support this observation in their

'Revised profiles of the Gifted and Talented', where 2e children are shown to display feelings of helplessness, discouragement, frustration, mood variations and academic inadequacy. As would be expected, the 'Revised Profiles of the Gifted and Talented' has been updated from the 1988 version (Betts & Neihart, 1988) in line with on-going release of research findings over the 20-year period. The authors' matrix includes six profiles: Type I The Successful, Type II The Creative, Type III The Underground, Type IV The At-risk, Type V Twice/Multi Exceptional, and Type VI The Autonomous Learner, which all represent a more holistic approach (Roeper, 1982) to comprehend giftedness. In one of the Profiles particularly relevant to the Study, Type V Twice/Multi Exceptional, the inclusion of a number of frequently observed traits, including those listed above, are in alignment with typical observations noted in the literature (Munro & Wills, 2009).

2.3.3. The perennial issue for teachers: Underachievement

Consideration of issues with definitions immediately gives rise to the question of underachievement, which is not only problematic to twice-exceptional children but affects the performance of all children, including those who are gifted, as well as those who have LD. As Montgomery (2009, p. 267) points out, many children underachieve and in her study involving 1250 classrooms in England in 2002, it was found that 80% of the children were not achieving at their ability level. This finding suggests the greater likelihood of underachievement in 2e over and above the trends of the general population as a result of the tendency for learning difficulties to mask true ability (Davis & Rimm, 2004).

There is wide acceptance of underachievement as discrepancy between ability and achievement. For instance, NSW DET (2004, *Definitions*), for instance, states that underachievement means that the child is not achieving at his/her full potential shown by school performance as compared to another benchmark/index. The index is not specified but it would be reasonable to assume it would be an IQ test or school standardised test. However, there is controversy about the usefulness of using school-based standardised assessments.

Issues with testing complicate the question of underachievement. Some researchers suspect that a high percentage of results that are believed to be linked to underachievement are attributed to test error (Colangelo, Kerr, Christensen, & Maxey, 1993). Questions are also raised about the reliability of i) subjective interpretations of classroom results, ii)

decisions about class achievement levels and, importantly, iii) whether standardised tests are truly reflective of what children may or may not be learning in class (Reis & McCoach, 2000). Furthermore, the measures used can also contribute to the problem of underachievement. For example, children's results may be affected by:

- test anxiety, including issues arising from maladaptive perfectionism (Flett et al., 2016);
- "processing speed or attention deficit problems" (Rimm, 2008, p. 139);
- limited exposure to a stimulating curriculum (Rimm, 2008); and
- level of interest/motivation (Clemons, 2008).

However, in spite of these limitations with formal testing, Assouline and Whiteman (2011) found from their case studies and the research literature that in a comprehensive assessment protocol, it is important to include formal measures of discrepancy in ability and achievement to determine the strengths, difficulties and disparities in the twice-exceptional.

2.3.3.1. Further factors influencing underachievement

The concept of underachievement is linked to a multitude of issues and/or causative influences. The most pertinent dilemma is centred on the different interpretations of giftedness. Ziegler, Ziegler, and Stoeger (2012), claim that these variations present anomalies for defining underachievement. This situation is compounded by the complex interplay of external/environmental and internal/personal factors/catalysts (including LD) impacting on the child and in the case of the Study – the twice-exceptional child. Examples of these environmental influences are:

- *cultural differences in perceptions of success and learning* (Bevan-Brown, 2011; Hoover-Schultz, 2005; Montgomery, 2009; Munro, 2011). Bevan-Brown (2011) gives the example that perception of giftedness in the Maori culture whilst having similarities with western culture, also link the construct to potential being actualised within the context of group membership. Munro (2011) emphasises that generally there is variation in how different cultures interpret giftedness – a view also supported by Thraves and Bannister-Tyrrell (2017). Underachievement in indigenous populations (including Australian Aboriginal people) can be influenced by socio-economic factors and cultural expectations, which include "peer acceptance" (Chaffey et al., 2015, p. 27), also known as the forced-choice dilemma (Gross, 1989;

Merrotsy, 2016; Yung, McCormick, & Gross, 2012). In addition, Borland (2004) refers to the underrepresentation of cultural minorities, including socio-economically disadvantaged children, in gifted programs in the United States, which is parallel to observations for Australian Aboriginal (Harslett, 1996; Merrotsy, 2016) and Torres Strait Islander children (Merrotsy, 2016).

- *peer pressure not to excel* (regardless of cultural background) (NSW DET, 2004, *Underachievement*). This influence can result from "a gifted young person not wanting to ascribe to negatively perceived stereotypes associated with being gifted, or not wanting to accentuate an already self-perceived 'differentness' from their peer group" (Victorian Department of Education and Training, 2017, *Underachievement caused by peer pressure*, para. 2).
- *quality of teaching* which can be influenced by low teacher expectations of perceived low achievers leading to further decline in achievement, which is referred to as the 'Golem effect' (Ziegler, Broome, & Heller, Sep 1999; Ziegler et al., 2012);
- *inadequate procedures for the identification of 2e children* which can lead to "invisible underachievement" (NSW DET, 2004, *Underachievement*, p. 6).

Internal influences can include:

- *gender influences* on school-based achievement, with Montgomery (2009, p. 7) citing from DfES 2006 (Statistics of Education) that boys' achievement level is in the vicinity of being10% lower than girls;
- *a contradictory pattern of performance* shown by a tendency for gifted underachievers to gain high results in standardised tests, yet non-remarkable achievement levels in class results (Rimm, 2008); and
- *learning difficulties and related socio-emotional issues* (Krochak & Ryan, 2007)

To summarise this section, underachievement is a significant problem for 2e children and their teachers, and is influenced by multiple catalysts. In the light of these catalysts, a comprehensive assessment seems to be warranted. However, there remains another much debated issue about whether this protocol should include Intelligence Quotient testing.

2.3.4. The question of Intelligence Quotient (IQ) tests

Reviewing the problem of underachievement, it may seem logical to presume that psychometric intelligence test assessments would provide clarification of children's strengths and learning difficulties, but the literature is divided on their suitability as an effective means of identifying 2e. This section will review one of the main types of psychometric assessments for primary school children, to determine its usefulness.

2.3.4.1. Wechsler Intelligence Scale for Children

The most common clinical assessment tool referred to in the literature is Wechsler Intelligence Scale for Children – Fourth edition (WISC-IV) (Wechsler, 2003). The Scale measures performance on sub-tests connected to four indexes of cognitive ability – Verbal Comprehension, Perceptual Reasoning, Working Memory and Processing Speed. Whilst a normative interpretation in terms of focus on sub-test and overall IQ scores is questioned for 2e children due to the effect of LD on test results (Montgomery, 2009; Nielsen, 2002; Silverman, 2009b), examining the pattern or scatter of scores allows for intrapersonal interpretations of discrepancies between strengths and difficulties (Silverman, 2009b). Assouline et al. (2010, p. 104) refer to this review of a "student's performance across the indexes and corresponding subtests of the ability and achievement measures" as profile analysis. As an instance of typical variations in scores for 2e, Rogers (2011, p. 60) noted that in the Project2Excel project, "Children with discrepancies among their index scores of 23 points or more … seemed to include all of the children who were ultimately identified as twice exceptional". Nielsen (2002, p. 97) cautioned, though, that in the interpretation of discrepant scores the lower score may be at a level considered not needing remediation, although it may not reflect the child's intellectual ability. Furthermore Lovett and Lewandowski (2006, p. 522) also express caution about over-interpreting "uneven profiles", due to such factors as sub-test reliability, measurement error and level of motivation on the day of the test.

Although these insights may suggest caution for using IQ tests for possible twice-exceptional children it is noted that using a test such as WISC– IV (or V) in conjunction with a statistically compatible standardised test of achievement such as the Wechsler Individual Achievement Test, WIAT–III (Wechsler, 2009) allows for a more comprehensive assessment of 2e. Mayes and Calhoun (2007) in their study involving 54 children (six to 14 years) with diagnosed autism but not necessarily giftedness, found that

from using both of these tests they were able to ascertain above-norm results in WISC-IV Perceptual Reasoning and Verbal Comprehension Indexes, but below the norm in Working Memory and Processing Speed, as well below the norm in WIAT-II in written expression. The WISC tests are updated every 10 years and the more recent standardised tests in Australia include the Wechsler Intelligence Scale for Children WISC-V A&NZ (sic) (Wechsler, 2016b) and the achievement test Wechsler Individual Achievement Test WIAT-III A&NZ (Wechsler, 2016a). These two tests incorporate Australian and New Zealand cultural and language adaptations, and normative data. Of particular relevance to standardised IQ testing of twice-exceptional children is that the updated WISC-V when linked to WIAT –III claims to support "more flexible evaluation of specific learning disabilities" by "strengths and weaknesses analyses and ability-achievement discrepancy analyses" (Wechsler, 2016b, *More interpretative power*, para. 1).The advantages of including such standardised tests in an assessment protocol is affirmed by Assouline et al. (2010, p. 102) who found from their study involving 14 gifted students between the ages of eight and 18 years with a disability (SLD) affecting written expression that "Diagnostic/identification procedures that do not include a comprehensive evaluation place gifted students at serious risk for 'missed' diagnosis and ultimately, missed opportunity for intervention". This clear advantage is, however, subject to accessibility to clinical psychologists and affordability by families and/or schools, particularly in more remote areas of Australia.

2.3.5. Do teachers have understanding of twice-exceptionality?

Another key concept warranting review for the identification of twice-exceptional children is the question of teacher knowledge and awareness of both the range and diversity of traits that this sub-population presents, and appropriate identification measures. Research suggests that there are issues limiting teacher identification of 2e.

2.3.5.1. Teacher attitudes

Research on teacher attitudes to giftedness has yielded mixed findings. In a study involving 377 teachers from Australia, England and Scotland, Geake and Gross (2008, p. 226) found that there was some teacher reservation about giftedness, which was influenced by underlying concerns that advanced ability was equated with "social noncompliance". However, Preckel, Baudson, Krolak-Schwerdt, and Glock (2015, p. 1167) noted from their study of "182 pre-service teachers" in Germany that teacher

attitude toward giftedness was neutral. Yet when teachers reflected on the "disharmony hypothesis", that is, that gifted students were more likely to have adjustment issues, results indicated their negative attitude towards gifted boys (p. 1175). A further study by Lewis and Milton (2005) of the attitudes of 12 teachers at a Western Australian Montessori School, who were assessed both before and after professional development using Gagné and Nadeau's Attitude Scale: Opinions about the gifted and their education (Gagné, 1991), found that teacher attitudes were positive in both instances and that results of the second assessment were not significantly different. However, the authors in their post-research reflection questioned the suitability of the Scale both for the diversity of schools in the Australian context, particularly with regards to wording of the 34 items, and also "possible cultural differences that may impact on the interpretation of items by teachers working in countries other than the United States of America and Canada" (p.13). In their larger study of 262 teachers, based on a "national random sample" in the USA, McCoach and Siegle (2007, p. 249) found that training in giftedness had no impact on teacher attitudes. However, Bangel, Moon, and Capobianco (2010, p. 210) found in their small study, presumably in Fort Wayne, that 11 pre-service (elementary) teachers who participated in a 13-week "practicum-style training" in conjunction with a pre-service course in gifted education reported greater understanding of and confidence in meeting the learning needs of gifted children. Their findings are supported by Gubbins (2008, p. 672), although the author cautions that the on-going desired change of such training is not guaranteed due to inhibitory "political, societal, and educational forces" and teachers can revert to the "status quo because they determine that too much time, work, and resources are required". It is necessary therefore that professional development that contributes to teacher learning is systematic and on-going (Gubbins, 2008).

A further aspect of attitudes affecting teachers' 'accuracy' in determining the traits of 2e is connected to the assessment tool used. In educational research, Likert questionnaires, for instance, require contemplation/reflection about the items/questions and Glock and Kovacs (2013) found from their review of studies in implicit/explicit attitudes in the USA, that teacher respondents are more likely to give a more positive perspective. De Houwer (2006) also notes from the literature that teacher attitudes can be influenced by bias and the 'pull' to record socially acceptable responses, particularly if explicit measures such as questionnaires are used. This view is also supported by Preckel et al. (2015) cited above. In contrast, Glock and Kovacs (2013, p. 505) found that testing of automatic "implicit attitudes" tended to indicate more negative results, particularly if the cohort being

reviewed experienced LD or were in a cultural minority group or were economically disadvantaged. An example of a measure of implicit attitudes is the Implicit Association Test (IAT), which necessitates an automatic response (Greenwald, McGhee, & Schwartz, 1998). As feasible as these claims of the effect of explicit and implicit measurements may seem, it is noted that in a study of 74 primary school teachers in Western Australia, Vaz et al. (2015, p. 1) used a 7-point Likert scale The Opinions Relative to Integration of Students with Disabilities scale (ORI), together with Bandura's Teacher Efficacy scale, and found that "age, gender, teaching, self-efficacy and training, collectively explained 42% of the variability" in teachers' attitudes. The above views suggest the desirability for further clarification of teacher attitudes collectively and, where considered practicable, and subject to availability, even including an implicit test for assessing teacher views about 2e.

2.3.5.2. Teacher access to training and resources

In terms of teacher views regarding 2e, the findings tend to suggest that limitations to both pre-service training opportunity, as previously noted by Vaz et al. (2015), and access to assessment tools are hindering the identification process. It is noted that in New South Wales with regards to giftedness, there is a paucity of universities offering education in giftedness for pre-service teachers, with only three "providing a compulsory undergraduate subject" (Wormald & Bannister-Tyrrell, 2017 para. 2). Wormald (2011), in a study involving staff from eleven schools in New South Wales, found that there were limitations to teachers/schools identifying 2e thereby curtailing appropriate intervention. Furthermore, results from an earlier study indicated that teacher knowledge of the nature of gifted children with LD was lacking (Wormald, 2009). The author reported that teachers, although aware that 2e exists, felt restrained by their lack of knowledge of the issues these children encounter. Another important point she added was that teachers also acknowledged that issues involving lack of i) access to information in schools and ii) specific teacher training, as well as iii) the restrictions experienced of an already overfull curriculum, placed limitations on meeting the needs of 2e. According to these findings, teachers felt that identification depended on the expertise of specialist opinion and any accessible diagnostic reports. Following on from these observations, Bianco and Leech (2010, p. 319) in their study of three groups of teachers – general classroom teachers, special education teachers and gifted education teachers – observed that their recommendation for children to receive learning support/enrichment was influenced by "teaching credentials and by the presence or absence of a disability label". Teachers with

training in giftedness, for instance, were more likely to refer possible gifted children for enrichment but not so if there was a diagnosed LD.

The limitations in teacher experience and training in 2e, besides suggesting the need for focus on specific pre-service and teacher education, also requires a comprehensive assessment tool/protocol to capture a range of possible gifted abilities and learning difficulties. The next section addresses another key factor of educational policy to support these observations.

2.4. Educational policy requirements in Australia

To establish the foundation for the necessity of identification of 2e within the Australian educational context, clear educational policies exist in all States and Territories of Australia requiring equity for all children, including gifted/high-ability children with LD. This requirement is explicitly stated in the Ministerial Council of Education Employment training and Youth Affairs, MCEETYA (2008, p. 7) that there is a need to "promote a culture of excellence in all schools, by supporting them to provide challenging and stimulating learning experiences and opportunities that enable all students to explore and build on their gifts and talents".

Table 2.1: Australian educational policy requirements for identification of 2e

Policy statement regarding identification	Department of Education
Principal's responsibility	
Principals are responsible for ensuring access to identification of giftedness and talent.	Tasmania (2012); ACT (2016); NSW DET (2004)
Shared responsibility	
Schools, parents/caregivers, and central education offices all need to be involved in educational provision.	SA (2016); NSW DET(2004); NT (2016); QLD (2012); Tasmania (2012)
Research-based practice	
Education for gifted students must be informed by research and regular evaluation.	SA (2016); ACT (2016)
Comprehensive identification protocol	
"Multiple forms of identification" relevant to the school site are recommended NT (2016, p.18).	NT (2016)
Comprehensive assessment must have "reliable and valid assessment tools and strategies" SA (2016, p.5).	SA (2016); NSW DET (2004); QLD (2012)
Early identification is important.	NT (2016); SA (2016); NSW (2004)
Identification process must be on-going to reflect "the developmental and multifaceted nature of giftedness" SA (2016, p.5).	
Onus is on schools to identify gifted and talented students.	NSW DET (2004)
Identification involves "parents/caregivers, students, teachers, and other professionals" NSW DET (2004, p.7).	NSW DET (2004)
It is necessary to modify or differentiate the Curriculum.	Victoria (2017)
Gifted children with learning disabilities/learning difficulties	
Adjustments are necessary to support needs and strengths regarding giftedness and LD.	ACARA (2016b); NSW DET(2004); NT (2016); QLD (2012); WA (2011)
Terms used for gifted children with learning disabilities	
'Twice-exceptionality' and/or 'dual-exceptionality'	WA (2011); ACT (2016); NT (2016); Victoria (2017)
Gifted and talented students with learning disabilities; ACARA (n.d.-b) notes gifted students can also have a learning disability .	QLD (2012); NSW DET (2004); SA (2016)

Note: ACARA = (Australian Curriculum Assessment and Reporting Authority); ACT = (ACT Education & Training, 2016); NSW DET = (NSW Department of Education and Training, 2004); NT = (Northern Territory Department of Education and Children's Services, 2016); Tas = (Tasmanian Department of Education, 2012); QLD = (Queensland Department of Education Training and Employment, 2012); SA = (South Australian Department for Education and Child Development, 2016); Victoria = (Victorian Department of Education and Training, 2017); WA =(Western Australian Department of Education and Training, 2011)

Statements of policy requirements noted in department of education documentation for the six States (New South Wales, Queensland, South Australia, Tasmania, Victoria and

Western Australia and two Territories (Australian Capital Territory and Northern Territory) specific to Gifted children have been summarised in Table 2.1 and Learning difficulties are noted in Table 2.2. States and Territories refer to twice-exceptionality and the requirement for a comprehensive assessment protocol. In terms of the gifted focus, in line with ACARA's reference to Gagné's Model as providing "the most generally accepted definition" of "giftedness and talent" that is "research-based" and "logically connected to teaching and learning" all States and Territories acknowledge Gagné's DMGT 2.0 (ACARA, n.d.-b, *Gagné's Model,* para. 1–2). However, it is observed that some policies integrate Gagne's DMGT 2.0 more comprehensively than others, for example the South Australian (2016) and NSW policies make specific reference to their policies being based on definitions from the DMGT 2.0.

Table 2.2: Sources influencing policy of Australian Government educational departments

Government department	Gifted Model and relevance	Other Sources
Australian Curriculum Assessment and Reporting Authority (n.d.-b)	Gagné's DMGT (most accepted model) 2008	Sea Star Model (Tannenbaum, 2003); Three-Ring Model (Renzulli, 1978)
ACT Education and Training (2016)	Gagné's DMGT (relevant to identification and curriculum)	
South Australian Department for Education and Child Development (2016)	Gagné's DMGT (Policy based on DMGT)	
Western Australian Department of Education (2011)	Gagné's DMGT (definitions of giftedness and talent based on DMGT)	
Northern Territory Department of Education and Children's Services (2016)	Gagné's DMGT (relevant to schools' role in developing potential into high-level performance); Note recommendation of communication with Indigenous gifted community for identification and program development	NT Checklists for identifying intellectually gifted Australian indigenous students: Checklist for identifying gifted and talented underachievers; and including Three-Ring Model of Giftedness (Renzulli 1978,2005); Williams' Model (Williams, 1993); Maker Model (Maker, 1982); Bloom's Taxonomy(Bloom, 1956)
NSW DET(2004)	Gagné's DMGT (definitions of giftedness and talent based on DMGT)	Williams' Model (1993); Joanne Whitmore (1980); Renzulli (2005); Silverman (1993); Clark (2002); Betts and Neihart (1988); Sayler (n.d.)
Victorian Department of Education and training (2017)	Gagné's DMGT (definitions of giftedness and talent based on DMGT)	

Government department	Gifted Model and relevance	Other Sources
Tasmanian Department of Education (2012)	Gagné's DMGT (definitions of giftedness and talent based on DMGT)	
Queensland Department of Education, Training and Employment (2016)	Gagné's DMGT (refers to definitions of giftedness and talent)	National association for gifted children NAGC (n.d.)

To summarise this section on educational policy it is evident from the review of all related documents that recommendations and guidelines for addressing the needs of giftedness and learning disabilities are in place. It is clear from these documents that the onus is on schools to pursue identification processes.

2.5. Preliminary assessment: What questionnaires are available to assist classroom teachers with their initial enquiries?

The main thrust of the Study is centred on the preliminary stage of identifying 2e, so it is necessary to examine literature perspectives on the concept of identification and to review available questionnaires in the light of whether they are evidence-based, are linked to a gifted model, use non-labelling language and are suitable for teacher usage within the context of the primary school.

2.5.1. Spotlight on the term identification

The term identification arises from the process of assessment, where data obtained are used to determine the level or the particular characteristics that appear to be evident, or stage the child has reached. Identification and assessment are associated with several theories. The behaviourist and psychometric theories are both interlinked with the rationale for identification. The behaviourist theory is based on stimulus–response testing that aims to find the level of acquisition of learning objectives (Shepard, 2000). The psychometric theory places emphasis on determining achievement levels through the precision of standardised testing. Raykov and Marcoulides (2011, p. 9) point out that "psychometric theory is useful for measurement of any behavioral construct, such as an attribute, ability, trait, attitude or aptitude". The assessment procedures in the Study utilise

the framework of both theories and also incorporate cognitive/constructivist theories of learning. Of particular relevance in this latter theory is its recognition that intelligent thinking incorporates metacognition – often referred to as "knowledge about cognition and as regulation of cognitive activities" (Barzilai & Zohar, 2014, p. 16). A review of metacognition is found in Section 2.7.4.

2.5.2. Review of existing lists of characteristics of giftedness and learning disabilities/difficulties

To support the need for the development of a preliminary assessment tool in the form of a checklist questionnaire, a number of collated lists of twice-exceptional traits are reviewed. The relevant features apropos of both available screeners/checklists and lists are illustrated in Table 2.3.

Table 2.3: Features of selected screeners and lists of 2e traits

Author and/or title	GLD traits	Categories of strengths and difficulties	Clarity of meaning	Model of giftedness	Assessment grid	Minimal labelling language	Other comments noted by author
Screeners or checklist questionnaires for GLD							
Rogers Student Screener Inventory (Set 1 & 2) (Twice-exceptionality)	√	√	Varies	Not specified	√		Used in Project2Excel (2011)
The Spectrum of Characteristics (Wellisch & Brown, 2013)	√	None, but lists 11 LD categories/ disorders as noted in DSM-5, with observable gifted and LD traits	Gifted traits are clear but 2e traits vary	Not specified		√	Not to be used for diagnostic purposes and has not been trialled
Lists of traits for 2e							
Potential Plus UK (2014-2017)	√	√	√			√	
Montgomery (2009)	√	√	√			√	
Nielsen (2002)	√	√	√			√	
Bees (2009)	√	√	√			√	

2.5.2.1. Screeners/checklist questionnaires

1. *Rogers Student Screener Inventory (Set 1 & 2)*

In the United States of America (USA), a major study of 2e developed by Rogers (from 2008 to 2012), titled Project2Excel, used the Rogers Student Screener Inventory (Set 1 & 2) for diagnosed gifted children (Rogers, 2012). This instrument checks for a range of characteristics of both giftedness and LD. On page one of the Likert-type Screener there are 16 items associated with giftedness, inviting teacher responses on a Likert-type assessment grid ranging from 'Almost always', to 'Don't know'. The remaining four pages of the Screener are only for completion if the child receives 12 or more 'Almost always', or 'Frequently' responses. These latter pages are not titled, but it is evident that every page includes characteristics of a particular LD, namely Attention Deficit Disorder, Attention Deficit Hyperactivity Disorder, Autism Spectrum Disorders and Specific Learning Disabilities which are the four categories addressed in the study Project2Excel.

The Rogers Screener has merit in terms of what appears to be a representative selection of items for each of the five categories; however, several aspects question its suitability for general use in the classroom for non-identified possible 2e children. It would not be ideal for a preliminary enquiry by primary school teachers, who are not seeking to use the tool as an aid to formal identification. It is unclear whether the items are evidence-based, although there are similarities to gifted traits listed by Silverman (1989) and Nielsen (2002). It is also not indicated whether the Screener has been validated as an assessment tool. Furthermore, the language used in the learning disabilities categories could invite premature labelling and false negatives. In relation to the issue of labelling and, of particular relevance to the Study's focus on the development of a preliminary assessment tool, is McMahon's finding (2012) from a study involving 150 pre-service teachers at an Australian university, that there was concern that labelling can be derogatory, and lead to stereotyping.

2. *Wellisch and Brown* (2013): *The Spectrum of Gifted Characteristics* 2013

Wellisch and Brown (2013) refer to their untrialled screener Spectrum of Gifted Characteristics as a possible tool designed for usage in the preliminary stage of identifying GLD (2e). This Screener lists and includes information related to eleven DSM-5 Disorders (American Psychological Association, 2010) which can coexist with giftedness. These

Disorders include Attention Deficit Hyperactivity Disorder, Specific Learning Disorder, Autism Spectrum Disorder, Disruptive Dysregulation Disorder, Post-traumatic Stress Disorder, Conduct Disorder, Oppositional Defiant Disorder, Generalized Anxiety Disorder, Separation Anxiety Disorder, Obsessive-Compulsive Disorder and Major Depressive Disorder (American Psychological Association, 2010). The other inclusions in the Screener are characteristics of giftedness that are influenced/observable in 2e children with any of the DSM-5 disorders as well as "Attachment Characteristics" centred on the child's level of security usually with a parental figure (Wellisch & Brown, 2013, p. 46). Whilst this screener is an informative tool there is reservation about its suitability for primary school teachers who do not have the necessary training in clinical psychology to make judgements about some of the more complex mental health traits listed for the Disorders. The inclusion of the types of Disorders, although useful, could also invite premature assumptions particularly in the initial stage of inquiry. However, the authors caution that this assessment tool is not intended to be a means of formal assessment. They also note that usage and interpretation of findings from their model can have limitations, arising from the possibility of comorbidity.

3. *Potential Plus UK (2014–2017)*

Potential Plus UK (2014–2017), formerly known as The National Association for Gifted Children Dual or Multiple Exceptionality – United Kingdom, lists succinctly worded characteristics connected to intellectual strengths, academic difficulties, emotional needs and behaviour. It is a clear reference and would be helpful particularly for parents considering their child's possible traits. In terms of the list's usefulness for primary school teachers there are reservations including those cited above in terms of uncertainty about research base, and the definite nature of the items inviting premature labelling. A further limitation for the list's use in the primary school is its focus on only one aspect of giftedness namely the intellectual domain.

4. *Montgomery (2009)*

Montgomery's list of characteristics provides a profile of the often-seen characteristics of what she refers to as children with Dual exceptionality in terms of areas of underachievement and also strengths. She focuses on the key traits of five types of difficulties in the field of Special Educational Needs. This field in the United Kingdom incorporates "dyslexia, ADHD, Autistic Spectrum Disorders and dyspraxia/DCD"

(Montgomery, 2009, p. 265). The strength of Montgomery's underachievement profile is that the list is comprised of traits that are evidence-based. However, if the list were to be considered for a checklist for teachers, an assessment grid would be advantageous.

5. *Nielsen (2002, p. 95)*

Nielsen outlines typical characteristics of 2e children under the headings of Characteristics associated with giftedness, and Characteristics associated with learning disabilities, which are mainly clear in meaning and more detailed than what can be found in other lists. The list was formulated from a review of 315 children's files which contained views by parents, teachers and specialists and was then validated by comparison to the research of other authors. Specific details of the studies are not given, but it is significant nevertheless that Nielsen's findings are research-based, for example: social interaction difficulties (Reis, Neu, & McGuire, 1997); and issues with writing (Yates, Berninger, & Abbott, 1995).The same reservation would apply regarding the list's practical application as noted for Montgomery (2009).

6. *Bees (2009): GOLD Program*

Bees (2009), was the founder of a program called Gifted and Learning Disabled (GOLD) in Vancouver, British Columbia and her handbook lists traits under Intellectual abilities and then possible difficulties – academically, emotionally, and behaviourally (Bees, 1998). The author acknowledges Whitebread's role (2002) in the preparation of the lists, but apart from details of a teaching role, no further details are provided about this author. The traits are concise and in the lists of difficulties they are qualified to suggest that any difficulties noted 'may' possibly reflect the particular construct, which minimises any tendency for labelling. The lists would be suitable as back ground information for teachers and parents, although there are no indications of being empirically validated.

Most of the cited lists above are likely to be for information and reference purposes, and whilst they are beneficial as a starting point, it is imperative that the Study focuses on developing and implementing a preliminary assessment tool that has recognised categories of giftedness and learning difficulties for the school context. The next consideration centres on the nature of these categories.

2.5.3. What are necessary gifted components for a preliminary assessment tool?

In line with current educational policy for addressing the learning needs of all children and national acknowledgement of Gagné's DMGT 2.0 (2008), the model is reviewed for its suitability as a basis for the gifted component of a preliminary assessment tool.

2.5.3.1. Giftedness

Gagné's DMGT 2.0, shown in Figure 2.3, provides a foundation for the identification of gifted children (Gagné, 2010). One of the most significant aspects of the DMGT 2.0 is the assumption that giftedness (G) has the potential of being transformed or developed (D) into talent (T) (Gagné, 2010), subject to the positive or negative influence (Gagné, 2004) of one or more catalysts, which is referred to as the components of Environmental (E). This component consists of the sub-components of i) Milieu (EM), ii) Individuals (EI), iii) Provisions (EP), and iv) Intrapersonal (I). The latter sub-component incorporates Physical (IF) and Mental (IP) traits as well as the attributes necessary for goal management — Awareness (IW), Motivation (IM) and Volition (IV) (Gagné, 2008). For instance, in terms of the Study the development of high ability in GLD (2e) children can be affected negatively by lack of Provisions, which includes limitations in pedagogy, particularly identification and intervention. The other feature of the DMGT 2.0 that supports its suitability as an identification Model for a School-based questionnaire is the inclusion of a range of aptitudes or areas of endeavour where giftedness can be identified, not only in the Mental domains of Intellectual (GI), Creative (GC), Social (GS), Perceptual (GP), but also the Physical domains of Muscular (GM) and Motor Control (GR).

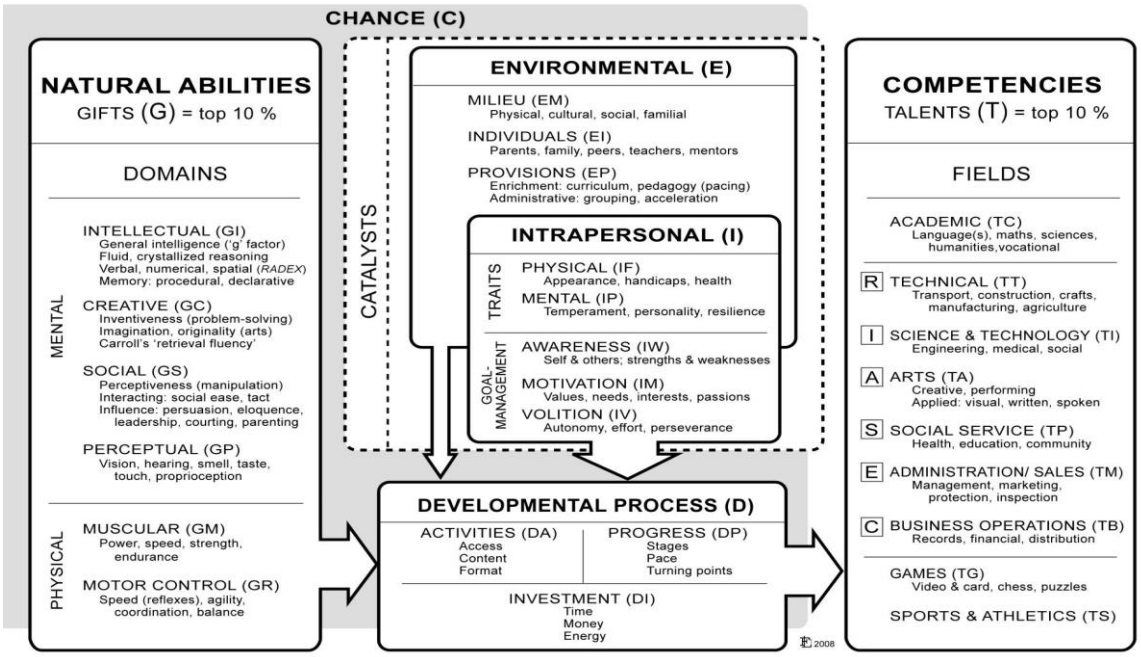

Figure 2.3: Gagné's Differentiated Model of Giftedness and Talent (DMGT 2.0; 2008 update) (Gagné, 2010, p.83)
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A key question arising from the DMGT 2.0 is the need to show the impact of learning disabilities as a catalyst inhibiting children's development of potential into performance. Gagné developed a further Model from the DMGT 2.0 (2008) and the Developmental Model for Natural Abilities (DMNA) into his Expanded Model of Talent Development (EMTD – Figure 2.4), which incorporates the influence of biology, including genetic profile on giftedness (Gagné, 2013), and logically would also include LD. The EMTD, therefore, is a highly relevant model for considerations of 2e. Gagné (2013, p. 8) points out that from neuroimaging techniques it is evident that "brain structures and processes were directly correlated with individual differences in cognitive, social or physical abilities, interests". Both the DMNA and the EMTD still incorporate the six Ability domains and both Models are relevant to the identification process.

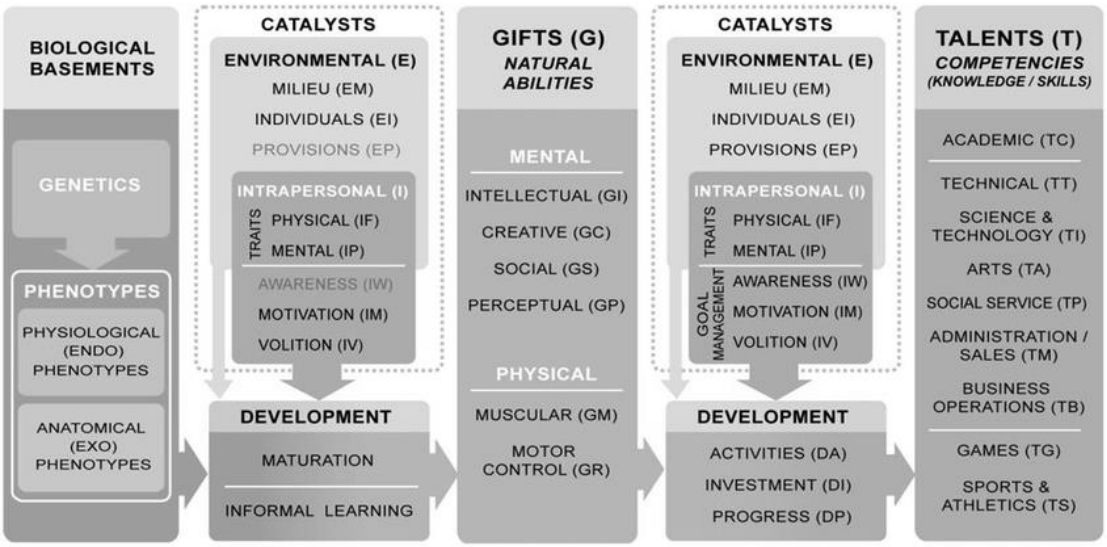

Figure 2.4: Gagné's Expanded Model of Talent Development (EMTD, 2013) Reprinted with permission

2.6. Summary: Sections 2.2 to 2.5.

To summarise the review of the previous sections the key conclusions are included in Table 2.4. These points will form the basis of comparison to the Study's findings.

Table 2.4: Conclusions from 2.2 to 2.5

Conclusions from 2.2 to 2.5
Giftedness (2.2.1.) • Definitions of giftedness tend to focus on extraordinary potential that, through interaction with a range of factors, can lead to remarkable achievement. • The intrapersonal factor of learning difficulties can limit the development of giftedness into talent and limit the recognition of giftedness. • Current educational policy acknowledges Gagné's DMGT 2.0 as a workable framework for gifted curriculum development or for definitional purposes.
Issues with definition of giftedness (2.2.1.1.) • Profiles of gifted students are diverse and achievement can vary in the same subject areas. • Gifted children can still experience challenges academically and may not have learning difficulties.
Learning difficulties/learning disabilities (2.2.2.) • Inconsistency in terminology is evident in Australia. • Learning difficulties arise from external factors and internal factors (including learning disabilities).
Twice-exceptionality (2.2.3.) • There is significant potential in one or more areas/categories of human endeavour that can coexist with one or more learning disabilities. • Definition is relevant to the multiple domains of Gagné's DMGT 2.0 (2008) and EMTD (2013).
Question of empirical research? (2.3.1.) • There is a paucity of empirical rigorous research.

Conclusions from 2.2 to 2.5
The diversity of twice-exceptionality (2.3.2.) • Range of complex and often multiple needs can include socio-emotional disabilities that are not always readily identifiable in either or both giftedness and LD.
The perennial issue for teachers: Underachievement (2.3.3.) • Underachievement is a discrepancy between ability and achievement influenced by multiple catalysts. • A comprehensive assessment protocol is suited for the identification of twice-exceptionality. • Formal measures of discrepancy are a useful part of the comprehensive assessment of 2e.
The question of IQ tests (2.3.4.) • Intrapersonal profile analysis of IQ scores may be useful for the identification process but need to be interpreted prudently.
Do teachers have understanding of twice-exceptionality? (2.3.5.) • There is teacher awareness of 2e but teachers feel restrained by their lack of knowledge of the issues these children encounter. • Teachers acknowledge problems with i) accessing information in schools, ii) specific teacher training, and iii) the restrictions of an already overfull curriculum. • Teacher attitudes towards LD and giftedness can influence recommendation for enrichment programs. • Teachers feel identification is dependent on specialist opinion.
Educational policy requirements in Australia (2.4.) • Australian policy requirements place onus on schools for identification.
Initial identification: What identification questionnaires are available to assist classroom teachers with their initial enquiries? (2.5.) • There are no publicly available checklist questionnaires that meet criteria of using a gifted model, non-labelling language, categories of strengths and learning difficulties relevant to the primary school for the initial identification stage.

2.7. Section 2: Other strategies for the classroom teacher?

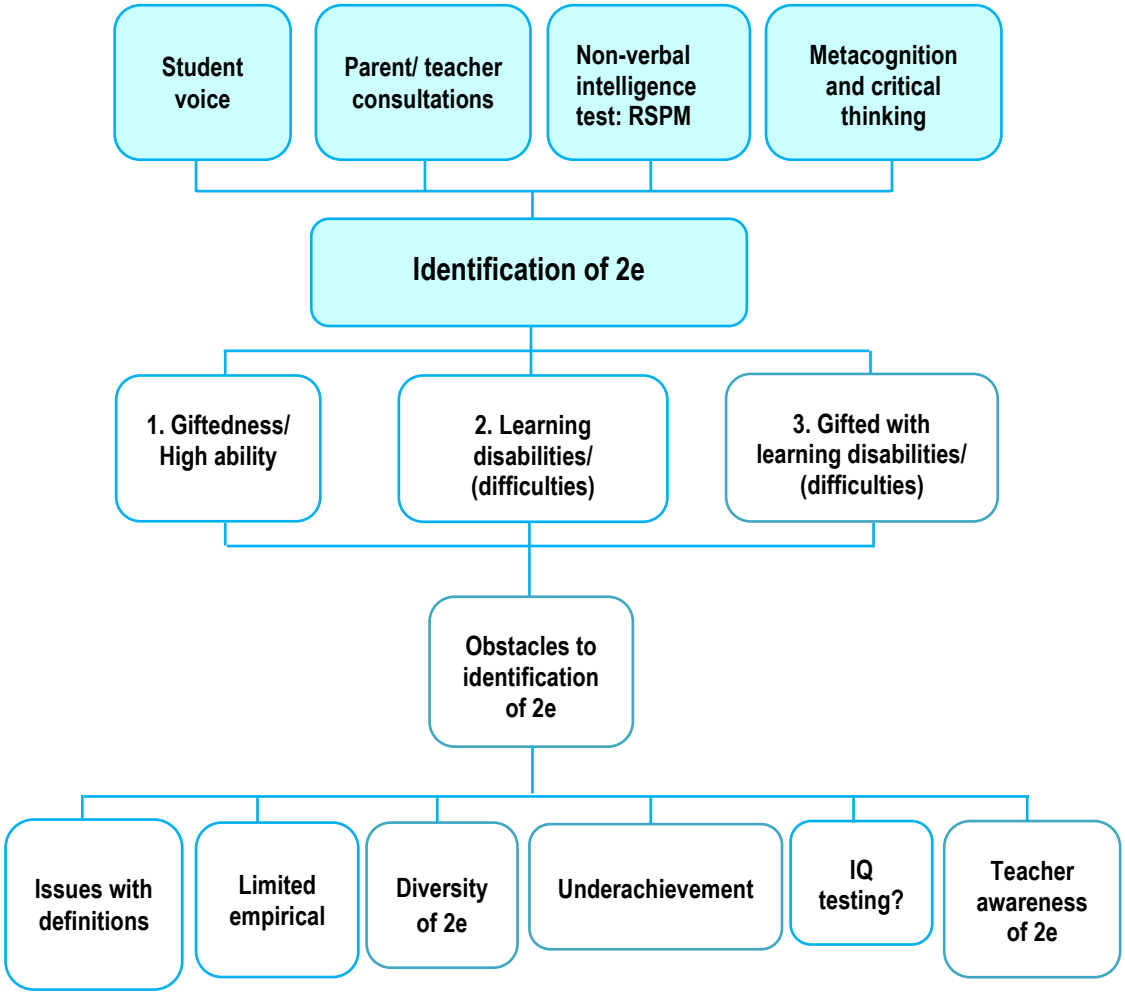

Figure 2.5: Diagram of other strategies for identification of twice-exceptionality

Note: Aqua highlight = concepts under focus in this section

2.7.1. The student voice

Listening to the student voice (Cook-Sather, 2006) can provide insights through self-report of perceived strengths and any particular learning difficulties. Reliability of self-reports for children can vary depending on their age and developmental stage (Borgers, de Leeuw, & Hox, 2000; Stipek, 1981). Veenman (2011), in his review of on-line methods of assessment including interviews with children, also notes that they are time-consuming. However, there is still opportunity for teachers to become more informed and improve pedagogical practice by accessing insights of the student voice (Rodgers, 2006; Schultz,

2003), a view which is supported by Cook-Sather (2006). In my review of the literature to date I have not located the inclusion of the student voice in assessment protocols for 2e.

2.7.2. Non-verbal intelligence testing

For primary school teachers who may not have access to IQ test results, an alternative and widely used non-verbal psychometric intelligence test is the Raven's Standard Progressive Matrices Test (RSPM) (Mackintosh & Mackintosh, 2011). This observation was also noted by Pind, Gunnarsdóttir, and Jóhannesson (2003). (Details of their study occur in the following paragraph.) Interestingly, RSPM results have a high correlation with the WISC tests (Mackintosh & Mackintosh, 2011). Furthermore, besides measuring analytical reasoning ability (Carpenter, Just, & Shell, 1990) and "fluid intelligence" (Hayashi, Kato, Igarashi, & Kashima, 2008, p. 306), RSPM does not require certification for test administration (Mills, Ablard, & Brody, 1993), which makes it more accessible for usage by classroom teachers, providing there is due familiarity with the Manual. It is also noted that the RSPM may be a more practicable alternative, particularly where the high cost of IQ testing could be prohibitive. Supporting the test's measure of intelligence for children with LD, Hayashi et al. (2008, p. 306) found in their study of "17 children with Asperger's Disorder, and 17 age-, gender-, and FIQ-matched normal children", that the RSPM detected higher fluid reasoning skills in the children with Asperger's. These findings indicated that students with Asperger's had more success with the Raven's than the other participants. An examination of the testing procedure showed that the selection of child participants involved a rigorous methodology utilising WISC-III, and "clinical investigation" for the children with Asperger's, which also included teacher nomination for the non-Asperger's control group (Hayashi et al., 2008, p. 307). This study was influenced by the findings of Dawson, Soulieres, Gernsbacher, and Mottron (2007) who found in their study of 38 diagnosed children with autism at a hospital in Montreal, Canada, that they achieved high scores in RSPM, suggesting high fluid intelligence and analytical reasoning skills in this population of children (Hayashi et al., 2008).

Whilst there is evidence to suggest the value of a non-verbal test such as RSPM, there are some reservations. Mills, Ablard, and Brody (1993, p. 6) report limitations, mainly apropos of the test's limited information regarding norm comparisons, particularly in the USA; however, they acknowledge that the RSPM Manual does indicate international norms. They also maintain that scores don't necessarily relate to school performance

adding that the RSPM measures "a very general, abstract reasoning ability that is moderately related to both general and specific measures of ability" (p.3) and do not provide information on cognitive strengths and weaknesses. As observed in the literature regarding underachievement in 2e, this observation is not an isolated phenomenon. Pind et al. (2003), in their study of 665 children representing the 10 grades of Icelandic primary school (6 to 16 years), found from the results of RSPM assessment that the ceiling effect was evident in older children. Mills et al. (1993) indicate that this issue could also be problematic for younger gifted children. It is also noted by Chaffey et al. (2015, p. 26) that in their study of 79 Australian Aboriginal children from Years 3 to 5 that overall, lower scores on one RSPM pre-test, compared to results after a "metacognitive intervention" for one of the two groups, were not a true reflection of the children's ability. In spite of these perceived limitations, it seems that RSPM has value if used prudently, particularly for students of high ability who may be undetected by other assessments. It may also be useful for "culturally different, disadvantaged, and limited-English-proficiency students, and possibly some learning-disabled/gifted students" (Mills, Ablard, & Brody, 1993, p. 6).

2.7.3. Consultation with parents

Whilst the inconsistencies of teacher awareness of the traits of 2e have been outlined, the following section clearly supports the inclusion of parental perspectives about the strengths and learning difficulties experienced by their children. In a case study by Wormald, Rogers, and Vialle (2015, p. 124) of the challenges faced by a twice-exceptional young adult in his school years, the authors found that not only were school-based educational services essential to the identification of and intervention for 2e children, but parents were also vital to this process. The parent of the young adult was reported to have provided a vital extra layer of data triangulation, particularly regarding insights about both management/support of his/her child's needs and the subsequent impact on family life. No doubt recognising the limitation of case studies in terms of their sample size, the authors acknowledge that the case study was part of a bigger research project exploring the reasons why Australian students "were not being identified or served in Australian schools" (p.124). Dare and Nowicki (2015) also support the inclusion of parental perspectives owing to their first-hand experience of children's needs. Their perception was based on the findings of their small study in Southern Ontario, Canada, involving five parents of five twice-exceptional children. Bees (2009) adds that these insights could include information about a possible family genetic link. However, whilst

affirming the need for the parent voice, Dare and Nowicki (2015) found that parents would benefit from resources to support them in their vital role as advocates for their twice-exceptional children.

There is consensus that the parent voice is a vital link in the understanding of the needs of twice-exceptional children in terms of their home observations. Another observation within the context of home or school is an online or concurrent observation of children's skills of metacognition and critical thinking and is reviewed below.

2.7.4. Focus on assessment via metacognitive abilities and critical-thinking skills

> "…encourage their children to think about their own functioning, to be self-reflective, to monitor and regulate their own activity, to look before they leap and think before they act when appropriate" (Advice from Flavell for parents and teachers, cited in Veenman, 2008, p. 225).

The research literature indicates that accessing children's metacognitive ability and critical-thinking skills provide insight into their thinking and learning capacity, which may not be readily identifiable through standardised testing nor by teacher reflection for an explicit questionnaire, but require direct observation referred to as an on-line approach. The terms 'metacognition' and 'critical thinking' need clarification due to the complexity of terminology, confusion over usage and at times overlap of meaning. The following section will review current interpretations of these constructs, their link to giftedness and their role in learning, thereby establishing the importance of an on-line assessment tool of metacognition and critical thinking. The meaning of the term 'on-line' in this context is explained in the following section.

2.7.4.1. Metacognition

The self-regulatory function of metacognition involves a more in-depth cognition/knowledge about cognition, as well as regulatory processes (Barfurth, Ritchie, Irving, & Shore, 2009; Tarricone, 2011; Veenman, Van Hout-Wolters, & Afflerbach, 2006). Metacognition as a construct had its origins with Flavell (1979). The two core components of Knowledge and Regulation and their related components and sub-components are included in Figure 2.5, which is an adaptation from Tarricone's model of Taxonomy of Metacognition (2011).

To explore metacognitive knowledge and skills requires an on-line assessment approach involving observation "during task performance" (Veenman et al., 2006, p. 9) of verbal responses and non-verbal behaviours (Veenman, 2017; Whitebread et al., 2009). A typical on-line protocol accessible for teachers is known as the Think-aloud protocol (TA) (Klingner, 2004; Kymes, 2005; Oster, 2001; Schellings, Aarnoutse, & van Leeuwe, 2006), which is reviewed in Section 2.7.4.3.

2.7.4.2. What is the relevance of metacognition to the question of the preliminary assessment of twice-exceptional children?

My search of the available literature has not yielded any assessment protocols used in Australia that include on-line assessment for the identification of gifted, let alone 2e children – yet research findings suggest that there is an association between giftedness and aspects of metacognition (Barfurth et al., 2009; Hannah & Shore, 1995). The following section reviews the separateness yet connection between the two constructs. (See Figures 2.4 and 2.5 for reference to the metacognitive terms used.)

Various authors highlight the relevance of metacognition to the effective learning of all children. However, Veenman et al. (2006) point out that metacognition itself is not necessarily synonymous with intellectual ability – a view which is supported by their findings that average intellectual ability resulted in 10% of variation in learning, and metacognitive skills 17% and that, therefore, both innate abilities were independent. Similarly, Alexander, Carr, and Schwanenflugel (1995, p. 17) found that for metacognitive monitoring of cognitive processes there were "no pervasive ability related differences in the average to gifted range of intelligence". Interestingly, according to Veenman, Wilhelm, and Beishuizen (2004), it is metacognitive skills that have a greater impact on learning ability than intelligence. This view is supported by Pintrich (2002) who claims that metacognitive knowledge and regulation of knowledge are fundamental to effective learning for all children.

Although the previous assertions could imply reservations about the value of using a metacognitive assessment in the identification of 2e, there is evidence pinpointing metacognitive components that have a clear association with giftedness. For instance, Alexander et al. (1995, p. 26) state that "declarative" metacognitive knowledge is stronger in gifted children, whereas monitoring of cognition is "equally difficult" for children of varying abilities. In recent research, Bannister-Tyrrell, Smith, Merrotsy, and Cornish

(2014, p. 8) found that in talented readers between the ages of 7 and 12 years there was marked evidence of not only declarative knowledge, but also other knowledge components of "procedural", "conditional", and "metacognitive skills" and behaviours. Helms-Lorenz and Jacobse (2008) in their study of both native and migrant students in the Netherlands, also noted stronger metacognitive skills in their high-ability group, although these were found to be only slightly different from the other groups. Furthermore, in a study in 2000 in four schools in the United Kingdom involving six gifted Year 1 children and their parents and teachers, Williams and Rask (2000), cited in Williams (2003, p. 252), indicated that awareness of metacognitive thinking was a "significant factor in their learning". Hannah and Shore (2008), mentioned above, also observed in their study of twice-exceptional boys in 5th, 6th, 11th and 12th grades using Think-alouds to access reading strategies, that there were similarities in verbalising metacognitive behaviours to gifted students without learning disabilities.

2.7.4.3. Think-aloud protocol – How useful is it as an assessment of metacognitive ability?

The Think-aloud protocol, used as a tool in assessing verbal comprehension of a written text, can vary procedurally but generally involves a process of a student reading and articulating strategies to aid comprehension (Schellings et al., 2006; Wade, 1990), and provides opportunity for observing metacognitive behaviours and ability. The text selected is typically at the child's instructional level. Klingner (2004) notes that text at instructional level can be read by the child, but with some challenges, which provides an ideal situation for the utilisation and observation of metacognitive abilities. The literature tends to affirm the TA's usefulness, but also includes some reservations about viewing the results as sacrosanct.

The advantages of the Think-aloud protocol are centred on the range of metacognitive abilities and behaviours that can be observed via its on-line approach or as Whitebread, Coltman et al. (2009, p. 65) refer to it, "concurrent self-report measures". For instance, for teachers evaluating a student's metacognitive knowledge, the use of the typical feature meta-language (Bannister-Tyrrell, 2013), including level of sophistication and use of more technical terminology, provides insight particularly about articulated or implied knowledge of existing cognitions (Williams, 2003). Another advantage of the TA, is that

its self-report focus is particularly suited to the typically stronger verbal skills of twice-exceptional children (Assouline et al., 2010; Ruban & Reis, 2005).

In terms of regulation of cognition/metacognitive skilfulness, several authors point to the value of observing modality (Bannister-Tyrrell, 2013), non-verbal behaviours (Whitebread et al., 2009), and even self-talk as an indicator of self-regulation (Duckworth, Gendler, & Gross, 2014; Lee, 2011). Modality is a feature of language used by an individual to express the likelihood of his/her perceived proposition (Nuyts, 2001), which in the case of the TA protocol is related to interpreting the text. In terms of the context of each participant articulating thoughts about text, epistemic modality has particular relevance. It includes modal verbs and adverbial modifiers to express "what is possible or necessary given what is known and what the available evidence is" (von Fintel, 2006, p. 21). In terms of non-verbal behaviours, Whitebread et al. (2009) note that they tend to be more observable in younger children and can include, for example, pausing with a facial expression suggesting reflectiveness. It would also be likely that non-verbal behavioural responses can give indications of confidence level, particularly in the case of some 2e children. Self-talk (covert and/or overt) not only can indicate self-regulatory (including metacognitive) processing but Winsler and Naglieri (2003) point out, can provide insights into critical thinking. Overt self-talk is more evident in younger children, because older children tend to internalise their thoughts (Lee, McDonough, & Bird, 2014), although this would depend on the child.

2.7.4.4. Limitations of the Think-aloud as a metacognitive assessment

In reviewing the literature, metacognition and its assessment present various challenges which require consideration. Wilson and Wing Jan (2008, p.10) indicate that although there are potential insights to be gained about a child's metacognitive capacity, there can be issues with observation and measurement, which would particularly be the case if the observer is inexperienced with the TA protocol. A problem can arise where metacognitive processes can be implicit (Veenman et al., 2006; Whitebread et al., 2009) and the child participant may not be cognisant of them. Veenman et al. (2006, p. 6) add, though, that tacit metacognitive processing can still be "inferred from certain cognitive abilities". However, use of inference is problematic, which is highlighted by Hannah and Shore (2008), who found in their study (noted above) that whilst the older boys tended to monitor and evaluate more than the younger boys in the TA procedures, there was the

question of whether unarticulated metacognitive strategies in a number of the younger boys was a true observation. The authors comment that they could only state that these strategies were not articulated: "Verbal data only provide a window into the cognitive processes being used" (Hannah & Shore, 2008, p. 15). They also noted that differences between the younger and older boys may be attributable to the developmental nature of metacognition and reading. Interestingly, Alexander et al. (1995) found that metacognitive skills develop earlier in gifted children, although according to Veenman et al. (2006), this observation depended on the type of skill. They observed that "monitoring and evaluation appear to mature later than the others" (p. 8). In addition to all of the above points, Ward and Traweek (1993) indicate that observations of students' metacognitive ability can encounter limitations connected to their developmental stage/age, motivation, and even verbal abilities. Jaušovec (2008) also notes that a TA assessment represents an observation of what the student might be aware at the particular time, which Munro (2002) suggests may be influenced by his/her interest level.

The review of metacognition and its links to giftedness suggests that a tool such as Think-aloud would be advantageous, particularly where there is opportunity and guidance for metacognitive abilities to be "drawn out from within the student" (Barfurth et al., 2009, p. 413). The next section reviews another companion to metacognition, critical thinking, to justify its assessment in the Study.

2.7.4.5. Assessment of Critical thinking skills

> Critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, a guide to belief and action. (Scriven & Paul, 1987)

Linked to metacognition is the neurological function of critical-thinking skills, which at an advanced level tend to be a characteristic of gifted children (Linn & Shore, 2008) and warrant review for inclusion in an assessment protocol. Tarricone (2011, p. 28) refers to critical thinking as a facilitator of metacognitive abilities. However, although children with advanced critical-thinking skills may utilise metacognitive strategies, the two constructs are not synonymous (Kolencik & Hillwig, 2011).

Critical thinking has no real consensus of definition (Mall-Amiri & Ahmadi, 2014), but there are key general understandings that it is a deliberate process of analytical and

evaluative thinking (Cottrell, 2011) or ‘weighing up’ that needs to be taught (Scriven & Paul, 1996). These authors specify the key indicators in the above quote. Cottrell (2011) agrees that critical thinking is a process of weighing up, using certain skills and attitudes, for example, reflecting and using logic. Ennis (2013, para. 8) adds that the process of critical thinking is focused on endeavouring to “grasp a position clearly, to ‘get it right’, to find the truth if it is to be found, and to present a position honestly and clearly”. Sternberg (1986, p. 2) summarises all these definitions as “mental processes, strategies and representations people use to solve problems, make decisions, and learn new concepts”.

To conclude this section on metacognition and critical thinking, the review suggests that both constructs are integral to the question of giftedness and effective learning, and although metacognitive capacity is difficult to determine, an on-line assessment strategy with its main emphasis on verbal skills would be useful in the initial identification of gifted children with learning difficulties – many of whom may have verbal strengths.

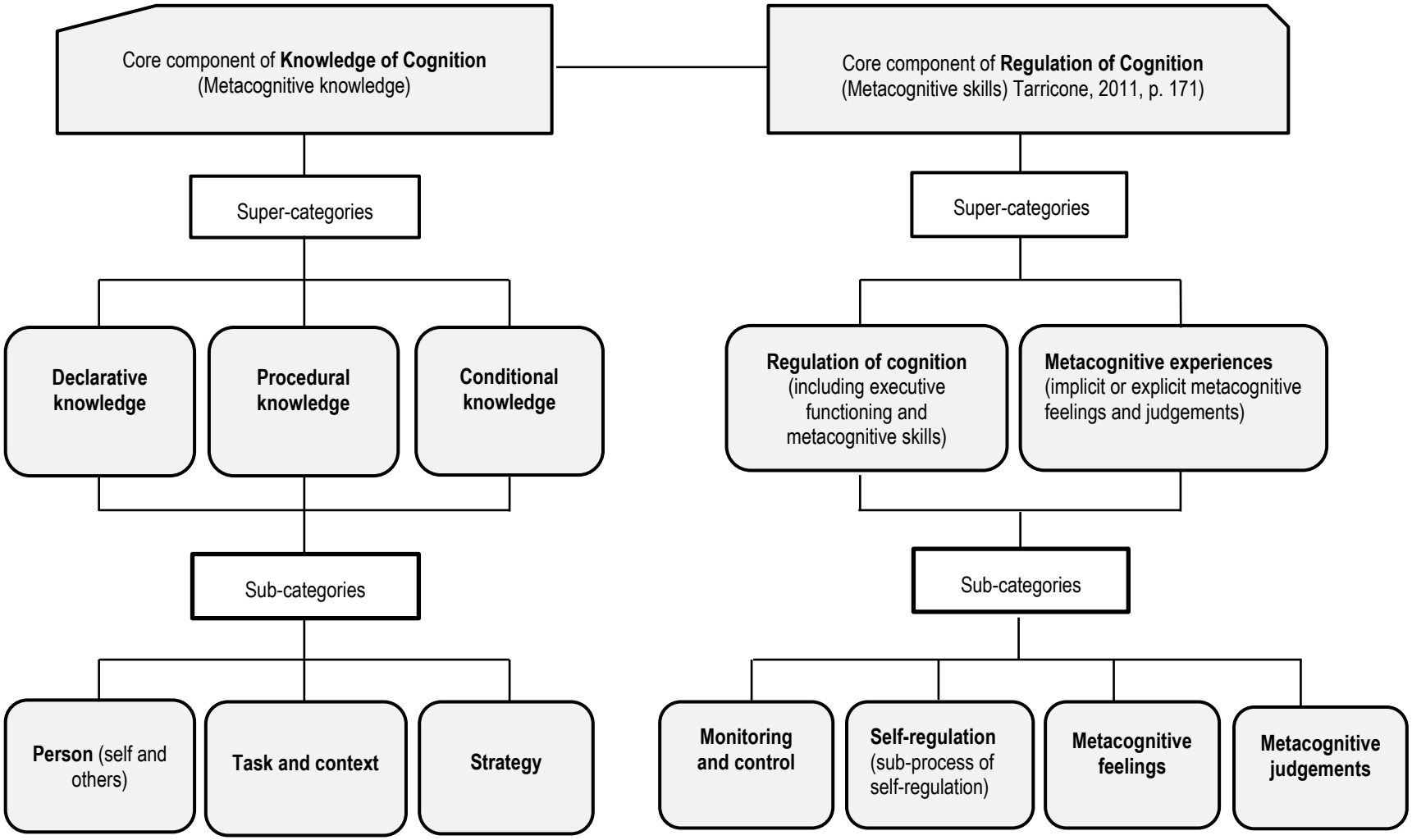

Figure 2.6: Core components Knowledge of Cognition and Regulation of Cognition and connected super-categories and sub-categories (adapted from Tarricone, 2011; Bannister-Tyrrell et al. 2014)

2.8. Section 3: Summary, research questions and conclusion

The review of the literature related to gifted children with learning difficulties has established a veritable minefield of issues connected to all the key concepts involved with identification. Inconsistent terminology and obstacles, including complex characteristics, underachievement, debate about Intelligence Quotient testing, sparse empirical research and variations in teacher awareness of 2e, all represent the current shaky foundation upon which to establish identification strategies. However, the consequent ramifications of 2e in terms of limitations to actualising potential in the educational setting and beyond, and associated socio-emotional issues, demand empirical research into its uncertain waters. Furthermore, Australian education policies require that all children, including the often more elusive sub-population of 2e are provided with optimal learning opportunities – beginning with appropriate assessment strategies.

Whilst two located screeners and multiple lists consisting of mixed anecdotal and evidence-based, typical twice-exceptional traits are available as a starting point, there is the urgent need for the development and trialling of a comprehensive and accessible assessment questionnaire for primary school teachers to access in the preliminary stage of identifying twice-exceptional children, that is, gifted children with learning difficulties. This tool requires a nationally accepted model of giftedness and talent (Gagne's DMGT 2.0, 2008; or EMTD, 2013) that includes a range of identifiable categories of giftedness, as well as categories of learning difficulties that are relevant to the educational context of the primary school.

The first research question, therefore, is:

1. What are the components of a comprehensive, useful checklist for the preliminary stage of identifying possible gifted/high-ability children with learning difficulties?

To establish whether other assessment strategies might be useful in addition to such a questionnaire, discussion focused on approaches that would capture in-depth data relevant to 2e including:

- listening to the student voice;
- testing with the non-verbal intelligence test (RSPM);

- consultation with parents; and
- assessment of metacognition and critical thinking skills.

The review found that the inclusion of the student and parent voice provide insights that are not readily accessible by other means and would justify a case-study approach. The use of RSPM was shown to be advantageous as a non-verbal assessment for 2e, although there are limitations if it is used in isolation from other assessment strategies. An on-line assessment of metacognitive and critical-thinking abilities was shown to be relevant in terms of their association with giftedness.

The second research question, therefore, is:

2. *To what extent can the Checklist be supported by other assessment strategies?*

With the need for further empirical research identified by the Literature review the following chapter begins the process of operationalisation by addressing the Study's Methodology, context and philosophical foundation.

Chapter 3. Methodology, Context and Philosophical Foundation

> In our view, people's texts are not trivial outcomes of communicative needs. Rather, they function at many levels and are the product of a person's entire set of political and psychological conditions and entities. Humans are constant creators of complex and multifaceted meanings (Gee, Michaels, & O'Connor, 1992, p. 233).

The Study sought to find assessment strategies for identifying possible gifted/high-ability, primary school children with learning difficulties. It represented the initial stage of the identification of twice-exceptionality. It was exploratory in approach – focusing on developing a comprehensive and useful teacher checklist questionnaire, and then reviewing to what extent this tool was supported by other assessment strategies. Typical of social research, the research process involved an interaction between the topic/ identified area of need, the research context, the underlying belief system, the methodology/research design features, and the specific methods. The key components driving the Study are presented in Figure 3.1 – namely the philosophical foundation or theoretical framework, methodology or approach, and procedures (Creswell, 2009). This framework provided the scope to best address the research questions.

To comprehend the significance and integral nature of the factors influencing the Study, this chapter first identifies the research question within the context of the educational setting and then explains and justifies the methodology – Mixed Methods Research (MMR). Following this development, focus centres on outlining two particular research designs that were used within the encompassment of MMR. One of these designs, Participatory Action Research (PAR), provided the framework for Phase One of the Study. Phase Two incorporated a case-study design. The chapter moves on to review the core of the Study, which is its philosophical foundation often referred to as the theoretical framework. From the platform of methodology and philosophy, the mixed-methods procedures of data collection and analyses are presented. This outline is followed by reviews of all of the following: the context of the school site and participants, the role of the researcher, and measures of credibility, transferability, dependability and confirmability (Gavin, 2008; Guba & Lincoln, 1981) for the qualitative component of the

procedures, and validity and reliability for the quantitative. Finally, adherence to ethical guidelines is specified.

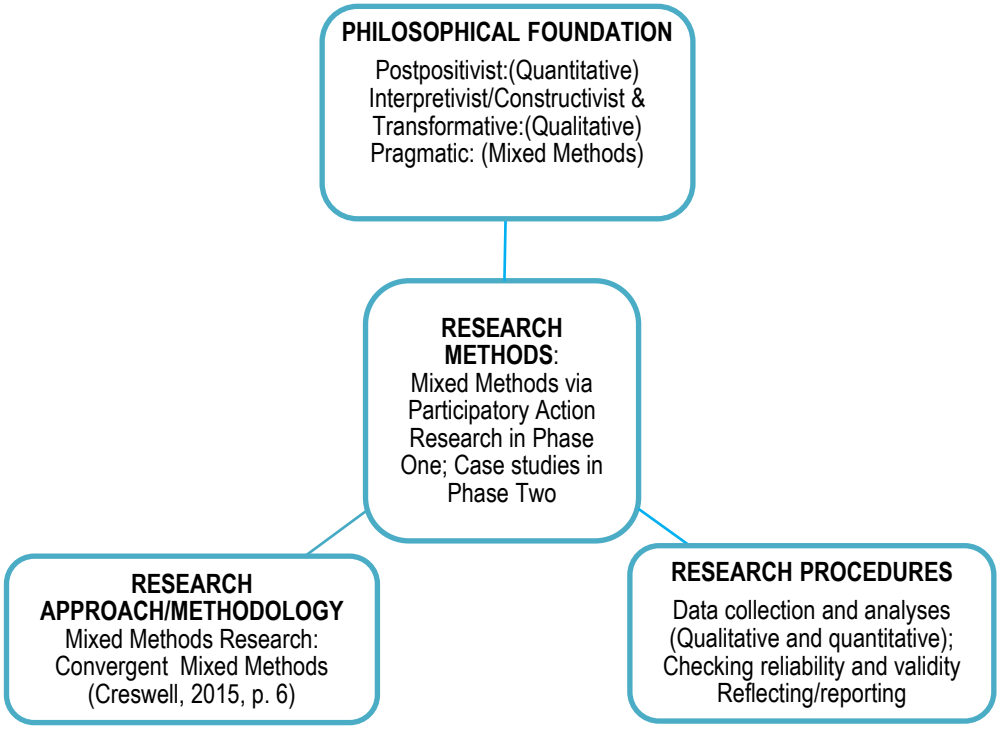

Figure 3.1: Key components that support the research methods Adapted from Creswell (2009); McKenzie & Knipe (2006)

3.1. Research context and questions

At the time of the Study, the administrative and teacher stakeholders connected to the school research site, namely the Principal, his leadership team (including the Assistant Principal), teaching staff, and their employer the Catholic Schools Office of a Diocese in New South Wales, were concerned that possibly very able children could be slipping through the 'system' with often recognisable learning difficulties, but whose high ability or giftedness may be undetected. (To preserve anonymity the Study refers to the employer's generic title of Catholic Schools Office – henceforth the CSO.) Consequently, there was a focus by consultants at the CSO and the school to seek ways of identifying these children as an essential step to reviewing the most appropriate curriculum content and pace of implementation to best suit individual learning abilities and needs.

This context meant that the Study was highly relevant in addressing a particular educational need for both more knowledge about the diversity of traits of twice-

exceptional children (2e) particularly in the initial stage of identifying gifted/high-ability children with learning difficulties, and for a practical preliminary assessment tool supported by other assessment strategies. The title for the Study, therefore, is:

Opening the doors of possibility for gifted/high-ability children with learning difficulties: Preliminary assessment strategies for primary school teachers.

There are two phases of the Study, each with its own key question. The Phase One question is:

What are the components of a comprehensive, useful checklist for the preliminary stage of identifying possible gifted/high- ability children with learning difficulties?

Phase One comprises two sub phases – i) Teacher Checklist Questionnaire Development (TCQD) and ii) Teacher Checklist Questionnaire Trial (TCQT).

Phase Two addresses the question:

To what extent can the Checklist be supported by other assessment strategies?

The most relevant questions were formulated and the overarching research methodology of MMR and the two research-design frameworks of PAR and case studies, together with mixed qualitative and quantitative procedures for collecting and analysing data, were all considered to be the most suitable. True to the philosophy of MMR, it was the research questions that strongly influenced the research methods employed in both data collection and analyses (Creswell & Plano Clark, 2011; Greene, 2008; Teddlie & Tashakkori, 2010). The interaction of educational context, the research purpose and the means of assessment formed an integral relationship (Cornish, 2012; Maxwell, 2003), which is a feature of MMR and allowed the inclusion of the two research-design frameworks.

3.2. Methodological considerations in MMR

Prior to outlining the methodological approach utilised in the Study, it is essential to clarify the meaning of several key terms that are used extensively in research literature. At times their precise meaning can be somewhat confusing, especially if there are numerous methodological references, which is typical of an MMR approach. For the Study, the terms and their meanings are as follows:

Methodology – refers to any one of the three approaches to research – qualitative, quantitative and Mixed Methods Research (MMR). In the Study the methodology is

Mixed Methods Research (MMR) – also referred to as the third methodological movement (Hall, 2013; Teddlie & Tashakkori, 2010).

Research design – is often used synonymously with methodology. In the Study it is used to denote a particular research framework, namely Participatory Action Research or case-study design. Each of the two research designs has its own distinct features, which provides a specific focus for the operation of the methodology.

Mixed-methods – is a combination of different methods used to provide a more comprehensive analysis of the research issues. The Study used both quantitative and qualitative analyses of data and therefore used mixed methods.

3.2.1. Definition of Mixed Methods methodology or MMR

Diversity abounds in interpreting the meaning of MMR, but for the Study I am using the definition by Tashakkori and Creswell (2007, p.4), that it is an approach to research "in which the investigator collects and analyses data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or program of inquiry". It is, therefore, not confined to the data collection procedures of only one of these approaches (Creswell & Plano Clark, 2011). As a result, MMR has the advantage of combining the strengths of qualitative and quantitative, which tends to compensate for inherent weaknesses (Creswell & Plano Clark, 2011; Johnson & Onwuegbuzie, 2004). The main weakness of qualitative research is that it is reliant on subjective perspectives, which by their very nature have certain expected limitations. With a quantitative approach, the focus on numerical data can limit access to acquiring potentially rich data from the particular social context (Creswell & Plano Clark, 2011). However, recognising the limitations of qualitative and quantitative methodology does not negate their value and for the purpose of the Study to investigate the two focus questions, using both approaches via MMR was advantageous.

Utilising the strengths of the two approaches meant that there was a wider range of options for data collection and analyses, important for the more in-depth exploration required by the nature of the research questions. This choice for the researcher can be referred to as "methodological eclecticism" (Teddlie & Tashakkori, 2010, 2012). Hall (2013) points out that a mixed-methods study will have two or more procedures yielding qualitative and quantitative data, which was the case for the Study. One of the strengths in obtaining

qualitative data is that it allows a greater understanding about an area of key focus, through exploring the perceptions of participants, either individually or as a group (Creswell, 2008). This endeavour to examine a situation, or a particular condition in detail, is also known as an idiographic approach (Babbie, 2011). Accompanying this approach are typical qualitative features of inductive reasoning (Babbie, 2011; Bazeley, 2002) and textual coding and interpretation (Bazeley, 2002). Complementing the qualitative approach is the quantitative approach which expands understanding and knowledge by providing numerical observations and interpretations of more than one situation or variable (Babbie, 2011). This nomothetic approach is structured and utilises deductive reasoning. As a mixed-methods study collects and analyses both qualitative and quantitative data it can be seen, therefore, that it often combines both idiographic and nomothetic interpretations (Bazeley, 2002).

3.2.2. The mixed-methods design used for the Study

A key characteristic of MMR is that it always features "a basic 'signature' research design and analytical processes" (Teddlie & Tashakkori, 2012, p. 782). There are controversies and subsequent variations in the literature about the most appropriate terminology for these signature features, which illustrates the need for precise definitions not only in this Study but also in MMR nomenclature. Creswell (2015, p. 6) outlines three typical designs, namely, "convergent", "explanatory sequential" and "exploratory sequential". The Study used a mixed-methods convergent design because data was collected from both qualitative and quantitative procedures in both phases of the Study and then analysed and merged before a comparison of the results. True to an advanced mixed-methods design (Creswell, 2015), there is also another feature in the Study and that is the exploratory nature of both phases and the more sequential development of Phase One. Reviewing the findings from both phases led to the integration, the convergence.

3.2.3. Position of the Study within the diversity of MMR

In considering the range of interpretations about the nature and characteristics of MMR, it is necessary to explain where the Study is situated in this almost "strange harmony of contrasts" (Puccini, 1900). I position the Study as a combination of two approaches, one put forward by Creswell (2009; 2010) and the other by Teddlie and Tashakkori (2010). Creswell is orientated towards viewing MMR as a 'methods' approach, but stresses that this does not mean that the qualitative and quantitative procedures are to be seen as

separate and unconnected and in fact claims that MMR incorporates "the connection, integration, or linking of these two strands" (Creswell, 2010, p. 51). He favours this approach due to the existing very real concerns that mixing methodologies leads to the issue of philosophical or theoretical incompatibility. Greene and Caracelli (1997) also support the view that at the technical level, viewing MMR as a combination of qualitative and quantitative methods is not problematic, but note that at the philosophical level there are issues. However, Teddlie and Tashakkori (2010) advocate that in MMR the most appropriate methods for the Study are taken from a continuum across the qualitative – mixed methods – quantitative philosophical approaches. As such they emphasise that MMR is not a dichotomy, nor an "either-or" approach (p.10). Their view is more methodologically and philosophically oriented (Creswell & Plano Clark, 2011). In essence, though, the perspectives of Creswell (2010), and Teddlie and Tashakkori (2010) in particular, have parallels in terms of the research outcome. To summarise the position of the Study, therefore, it seeks to use qualitative and quantitative methods and integrate the findings, but it also centres its approach in MMR methodology and philosophy. The philosophical foundation or theoretical framework of the Study, including the relevance of pragmatism is explained in Section 3.3.

3.2.4. The research designs used in the mixed-methods Study

The implementation of MMR unfolded via the research designs of Participatory Action Research in Phase One and case studies in Phase Two. Each design has its own distinct features, both of which require rigorous adherence.

3.2.4.1. Mixed Methods Research via Participatory Action Research – Phase One

The research design of Action research, which has had a long history in educational research (Noffke, 2009), can be seen to be a distinctive type of mixed methods (Christ, 2010), depending on whether it utilises mixed data-collection procedures. The type of Action research utilised in Phase One is referred to, as noted previously, as Participatory Action Research (PAR). This design is similar to its 'parent' but there is a greater emphasis on participation, or collaboration (Bergold & Thomas, 2012; Kemmis & McTaggart, 2005) between the researcher and the stakeholders connected to the research site in analysing social issues of concern. Kemmis and McTaggart (2005, p. 273) also

indicate two other typical PAR attributes of associated “shared ownership of research projects” and an “orientation toward community action”.

In both Action research and PAR, there is a cyclical or spiralling process. It commences with a reconnaissance phase (Kemmis, McTaggart, & Nixon, 2014) of establishing the social need or issue and exploring strategies that could lead to improvement. This cyclical or iterative process is also a typical feature of MMR (Teddlie & Tashakkori, 2010). Following on in the spiral are data collection, reflection and then using the findings to recommend a future plan of action (Dick, 2002; Ferrance, 2000). The cyclical process is shown in Figure 3.2.

The features of PAR that make it so suitable within the school context are that the process is flexible, involves teacher participants in a collaborative role and has recursive features (Figure 3.2), which allow for thorough exploration and development of the procedures in the research. In PAR, therefore, the researcher and stakeholders are seen as co-researchers (Bergold & Thomas, 2012). In Phase One of the Study, which represents one full cycle of a PAR design, the role of teacher co-researchers was incorporated through reflection and discussion in the Staff meeting presentation, and in the development of the Teacher Checklist Questionnaire (TCQ) where two teachers worked with me in reviewing and selecting the most appropriate items/variables. The PAR design has the assumption that teachers can enhance their teaching by reviewing their own beliefs and practices (Patton, 2002). This review is an illustration of what Kemmis and McTaggart (2005, p. 273) refer to as a community-based analysis, or a critical analysis of, in the case of the Study, issues centred upon both the existence and identification of possible twice-exceptional children. The whole process is enriched by having a community of teachers who provide a valuable collective resource for collecting and interpreting data to achieve the desired goal(s) (O'Brien, 1998). This advantage is influenced by the fact that not only do they interact with the goals and parameters of the study, but also interact within the context of the school and with other members of the school community (Brydon-Miller, Kral, Maguire, Noffke, & Sabhlok, 2011). Brydon-Miller et al. (2011, p. 388) affirm the importance of a collective involvement in the research project by stating that “all people in a particular context (for both epistemological and, with it, political reasons) need to be involved in the whole of the project undertaken”.

The possibility of working towards a school-based or community action – with the desired outcome of emancipation, a further feature of Action Research and PAR (Kemmis & McTaggart, 2005) – is reflected in the process of developing and implementing the TCQ for the purpose of identification of twice-exceptional children. Emancipation in this sense could be greater teacher insight about 2e, unidentified children being recognised for their true potential and consequent, appropriate educational intervention. Kemmis (2006, p 463) emphasises "that it is not utopian to hope for education that emancipates students, teachers and societies from irrational forms of thinking, unproductive ways of working".

It can be seen, therefore, that the core feature of PAR where co-researchers participate and work collaboratively is significant on various levels. The relevance of this scope to the professional development of teachers in both becoming more aware of 2e and in developing and implementing a checklist questionnaire for the initial identification stage cannot be overestimated.

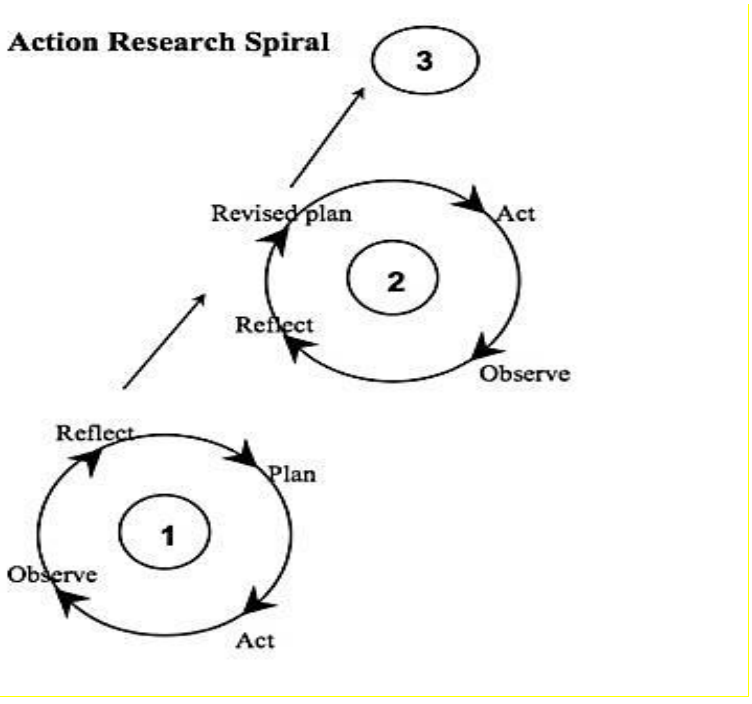

Figure 3.2: Action research spiral (Zuber-Skerritt, 2001, p. 15). Reprinted with permission

3.2.4.2. Inclusion of a trial in the PAR research design

To determine whether the developed Teacher Checklist Questionnaire has the capacity to generate data to address its purpose (Bazeley, 2013) and whether there is a need to make any amendments to its design, a trial was utilised in the Study. It is desirable for a questionnaire to be trialled prior to its wider implementation (Bailey, 2004).

Consequently, a trial serves a preparatory or exploratory function, which is particularly useful "to identify and address issues that could occur with respect to future study conceptualizations, study design, sample size, sample selection, data collection, data management and data analysis" (Moore, Carter, Nietert, & Stewart, 2011, p. 333). The results may even justify a further trial before widespread usage of the assessment tool (Westlund & Stuart, 2016).

3.2.4.3. Mixed Methods Research via the case-study design – Phase Two

Phase Two arose from the need to explore whether other strategies would support or question the TCQ findings, and even provide a rationale for using a comprehensive assessment protocol for the identification of possible 2e children. The case-study design in the Study is a form of mixed methods as it provided the framework to explore the research question in more depth (Glatthorn & Joyner, 2005) using various qualitative and quantitative strategies with a specific number of participants. A "multicase" case-study method was used (Stake, 2005, p. 6), involving six purposively selected child participants. The findings of the analyses allowed considerations of generalisation for the Study about the validity of the TCQ as a tool in terms of the findings of the Case studies. Generalisability is a relevant focus of validity in a case study, as the findings of the mixed-methods strategies are being compared and a generalisation made (Creswell, 2009). The Case studies also led to considerations of generalisation about the usefulness of a comprehensive protocol.

3.3. The philosophical/theoretical foundation of the Study

To understand the underlying theoretical background of MMR requires an understanding of the paradigms influencing qualitative, quantitative and mixed-methods methodologies. Fundamental to any research is the foundation of beliefs, assumptions or "worldview" (Creswell, 2009; Guba & Lincoln, 1994) that influences the researcher and subsequently drives the procedures of data collection and analyses (Lincoln & Guba, 2000). These worldviews can be referred to as paradigms and are usually categorised as 'positivist/postpositivist', 'interpretivist/constructivist', 'transformative'and 'pragmatic' (Creswell, 2009; Mackenzie & Knipe, 2006). The postpositivist paradigm is commonly regarded as the main companion of quantitative methodology, and the

interpretivist/constructivist and transformative, as pivotal to a more qualitative approach. It is, therefore, the paradigmatic and methodological combination chosen by the researcher that forms the framework for their study (Mackenzie & Knipe, 2006).

In the continuum between the interpretivist/constructivist and transformative paradigms dwells the process of PAR. The interpretivist paradigm has particular relevance to PAR because of the focus on gaining a more thorough understanding of how individuals – in this case teachers, parents, and primary school children – perceive the 'players' and the 'playing field' in the varying contexts of their lives (Stringer, 2008). The transformative paradigm also supports the research method, because it affirms the goal of desired change or improvement in developing and/or utilising assessment strategies that best assist in the initial identification of 2e children.

Within the transformative paradigm, is found 'critical theory' and 'praxis'. The former focuses on gathering the most applicable knowledge that will lead to emancipation. In essence, it achieves this goal by examining and challenging "the status quo" (Kincheloe & McLaren, 1994, p. 138). The praxis paradigm seeks the integration of theory and practice through the cyclical process typified by Action Research (Altrichter, Kemmis, McTaggart, & Zuber-Skerritt, 2002; Carr & Kemmis, 2009; Kelly, 2005; Levin & Greenwood, 2011; Noffke & Somekh, 2005; O'Brien, 1998; Totikidis & Prilleltensky, 2006; Zuber-Skerritt, 2001). Subsequently, the interpretive and transformative paradigms, including critical theory and praxis, provided a strong foundation for the Study, which sought to open doors of opportunity for 2e children.

The practical focus of praxis that is so vital to MMR via the two Research designs of PAR in Phase One and Case studies in Phase Two is connected to the paradigm of 'pragmatism'. A feature of pragmatism is that it utilises the most practical and appropriate methods to address an area of research, so I was able to draw upon a mixture of qualitative and quantitative methods and their underlying paradigms. I found the practical component of pragmatism very relevant, because in combination with the inquiry and reflective processes of PAR, there is the possibility of practical/usable knowledge being generated and, where possible, implemented (Manfra, 2009). It needs to be noted that the interpretivist and transformative paradigms can also utilise mixed methods, (Creswell, 2009) but pragmatism allows the incorporation of these and other paradigms via MMR (Greene, 2008; Mackenzie & Knipe, 2006). This encompassing approach was seen also in

the case-study design, which reflects the constructivist paradigm in the endeavour to understand or fit together more pieces of the research puzzle (Baxter & Jack, 2008).

A further advantage of pragmatism in the context of the mixed-methods study was the scope to utilise quantitative methods with the associated worldview 'postpositivism'. The postpositivist methods of empirical observation and measurement were incorporated in the use of questionnaires designed to test specific variables. Furthermore, relevant to the reductionist feature of postpositivism (Creswell, 2009), the variables selected were, subject to further testing, considered representative of the underlying constructs.

The scope of pragmatism drew upon the rich philosophy of multiple paradigms and provided the foundation in combination with MMR that was essential to the nature of the research problem and how it was addressed in the Study. However, this interpretation of pragmatism is not without controversy.

3.3.1. Controversies about mixing philosophical assumptions

There is current debate about pragmatism in the form of criticism about endeavouring to integrate what are considered to be opposing paradigms, particularly postpositivism and interpretivism/constructivism (Feilzer, 2010). During the 1970s and 80s there was much debate about the issue of perceived paradigm incompatibility (Cornish, 2012; Creswell, 2009; Denzin, 2012). This issue remains unresolved (Bazeley, 2002; Hall, 2013; Morgan, 2014; Teddlie & Tashakkori, 2012) but, without opting for what Denzin (2012, p. 84) refers to as a "soft" pragmatism, I have still based the foundation of the Study on pragmatism because it has become generally accepted by mixed-methods researchers, who recognise that the world we attempt to understand and measure is "an experiential world with different elements or layers, some objective, some subjective, and some a mixture of the two" (Feilzer, 2010, p. 8). Besides having a practical focus, pragmatism moves beyond a reliance on basing research solely on a philosophy of knowledge typified by a particular ontology, epistemology and methodology and looks through the philosophical lens advocated by John Dewey (American philosopher, psychologist, educator and supporter of pragmatism) of combining beliefs and action through the process of inquiry (Morgan, 2014). Feilzer (2010, p. 14) stresses that in this broader view, it is important not to lose sight that pragmatism still requires "a good understanding of quantitative and qualitative methods and analyses, which is transparent and replicable". Although pragmatism fits perfectly, if not conveniently, within the framework of PAR and also case studies, Greene

and Caracelli (1997), supported by Creswell and Plano Clark (2011), assert that it is still important to acknowledge the use and relevance of other paradigms that are incorporated in the Study.

3.4. Methods of data collection and analyses

The focus of this section now shifts to the mixed-methods procedures of data collection and analyses that were used in the two phases. Further more specific details are outlined in Chapter 4. Phase One: Research Methods.

3.4.1. Methods of Data-collection

Data collection in the study largely employed survey methods. One of the methods used was the "face-to-face" (Babbie, 2011, p. 291) process of interviewing, a key instrument employed in qualitative research to gather data about a range of areas under review, through a process of questioning and response. The collaborative process of PAR with other teacher participants incorporated discussion, which is described as an "informal ethnographic interview" (Mills, 2011, p. 79). A structured formal interview approach was used with the child participants in the Case studies as this method allowed me to ask participants similar questions, not only to elicit individual information, but also to compare responses. Semi-structured interviews that encompassed explanations and sharing of information were also used, for example, in outlining the research-based and anecdotal 2e characteristics with the teacher focus-group. I recorded the semi-structured and formal interviews using a Sony Stereo IC recorder and then transcribed and coded the data.

Another survey method of collecting data is through the format of a questionnaire where the respondent records his/her perceptions. This method is more time efficient for analysing a larger number of responses (Babbie, 2011; Mills, 2011). Three questionnaires were used in the research study. One was the open-ended Teacher Questionnaire: Perceptions about children who may be gifted with a learning difficulty, which henceforth is referred to as the Teacher Perceptions Questionnaire (TPQ) (Appendix 1) yielding qualitative data and the other two were rating-scale questionnaires (Phan, 2012), both of which provided quantitative data. One of the rating-scale questionnaires is the Teacher Checklist Questionnaire (TCQ), which is a Likert discrete linear scale (Appendix 2) where teacher respondents select the descriptor that best denotes their perception about each

question/variable/item. Table 3.1 includes the descriptors used in the 6-point Likert questionnaire used in the Study. The other rating-scale questionnaire, the Parent/Teacher Questionnaire (PTQ) (Appendix 3) is a visual analogue (or continuous linear) scale where a mark is placed on a 100-millimetre line to show level of response between two opposite descriptors (Cowley & Youngblood, 2009).

Table 3.1: Descriptors used in the 6-point Likert-type Teacher Checklist Questionnaire

Not applicable	Not observed	Uncertain	Sometimes	Often	Always

I decided to utilise both types of rating-scale questionnaires because, as part of the exploratory nature of the Study, I was interested to review both their methods of implementation and analysis and to compare the findings. The literature tends to have mixed views about which instrument is more reliable (Brunier & Graydon, 1996; Cowley & Youngblood, 2009), but it seems that generally speaking, they are considered to produce similar results (Guyatt, Townsend, Berman, & Keller, 1987). In a small study by van Laerhoven, van der Zaag Loonen, and Derkx (2004, p. 830), which examined responses by children using both types of questionnaires, it was found that there was "comparable reliability".

Further data collection occurred through accessing the school site's archival data, which comprise standardised test results. Extensive records of standardised test results of children in Years 2 to 6, mainly in reading comprehension and mathematics, were reviewed. As noted in the Glossary, in New South Wales, Australia, Year 2 children (approximately 7 years of age) are in late Stage 1, Years 3 and 4 children (approximately 8 to 10 years age range) are in the middle primary years (Stage 2), while children in Years 5 and 6 (between 10 and 12 years old) are in Stage 3.

In the second phase of the Study, a non-verbal general intelligence test was also used – the Raven's Standard Progressive Matrices (RSPM), (Raven, Raven, & Court, 2000). This tool is accessible to schools in the Diocese from the CSO.

3.4.2. Methods of data analysis

The process of analysing data, outlined in this section, involved qualitative and quantitative techniques. Typical of a mixed-methods study, the results were then integrated to inform the research questions.

3.4.2.1. Qualitative data technique – Content analysis

The qualitative data to be analysed arose from the TPQ, some optional open-ended responses from the two rating-scale questionnaires (the TCQ and the PTQ), two interviews, and also a Think-aloud assessment, which focuses on reading skills and critical thinking and metacognitive strategies. The data were analysed mainly using the content analysis technique (CA). Importantly, these analyses were not isolated observations or generalisations, but were contextualised (Bazeley, 2009) and part of a cohesive or integrated exploration (Bazeley, 2012) to address the purpose of the research via MMR.

Content analysis is used extensively in qualitative research and involves a "subjective interpretation of the content of text data" (Hsieh & Shannon, 2005, p. 1278) and then systematic categorising and labelling (Punch, 2014). The data for this more conventional type of content analysis, which can be in the form of spoken, written or digital text, can come from multiple sources (Hsieh & Shannon, 2005). Pivotal to content analysis is the systematic procedure of categorising or coding the text, which essentially means that the transcript responses are placed in categories that can be descriptive, topic- or theme-related (Richards, 2005). The framework for coding is set up a priori (Neuendorf, 2004). The number of responses in each category influences the selection of key themes. Although CA is regarded as a qualitative tool, it utilises quantitative analysis (Neuendorf, 2004) apropos of determining the number of responses. It is thematic coding that was utilised in the Study and the results were tabulated for ease of interpretation.

There are key advantages in using content analysis, as well as some limitations. Coding text allows for interpretation of themes or categories that help inform the questions being considered (Saldaña, 2009). It is noted that the terms categories and themes are at times used interchangeably (Bazeley, 2009) but I use 'category' as a descriptive code or topic, and themes as associated elements (Bazeley, 2009) connected to the category. The issue with coding is that it is subjective, both in the choice of categories and in how the responses are interpreted. For this reason, the coding was checked for inter-rater reliability

by two teachers who were not part of the study. This process involved each teacher and I reviewing and, where necessary, making any adjustments to how the responses were categorised. Inter-rater reliability is an important tool in qualitative analysis to ensure consistency and therefore reliability (Hruschka et al., 2004).

During the latter part of the Study I reviewed the suitability of using NVivo qualitative data analysis Software (QSR International, 2015) to analyse the TPQ data. Whilst this Software tool is only as effective as the quality of data preparation for importing, and the "interpretive capacity" of the researcher (Bazeley & Jackson, 2013, p. 3), it offers wider scope for the researcher in content analysis mainly connected to management and analysis of data (Bazeley, 2013; Edhlund & McDougall, 2016). Consequently I used the tool for comparison purposes with the coding cited above, particularly via its querying and visualisation options (Kaefer, Roper, & Sinha, 2015, May).

3.4.2.2. Quantitative data techniques using statistics

The quantitative data were analysed using Microsoft Excel for descriptive statistics and the IBM Statistics Pack for the Social Sciences (Version 23.0). I was seeking numerical results to provide precise information about the data from the rating-scale questionnaires. William Thomson (Lord Kelvin), a mathematician and physicist (1824–1907), affirmed the importance of numerical measurements:

> When you measure what you are speaking about, and you express it in numbers, you know something about it; but when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind. (Remenyi, Onofrei, & English, 2011, p. 1)

Qualitative researchers may accuse Lord Kelvin of having considerable bias, but the inclusion of quantitative as well as qualitative data has value in a research study (Bonoma, 1985; Tashakkori & Teddlie, 2010).

Descriptive statistics were used to analyse the raw data in the questionnaires. This analysis involved investigating mainly the mean results for comparison purposes. I used Microsoft Excel for the initial recording of numerical data, calculations of mean and standard deviation, and developing graphical outputs. Although Excel is useful for descriptive statistics, it is not a specialised statistics package and there can be inconsistencies in some areas of analyses (Cryer, 2001; Mélard, 2011). However, the program was most useful for

enhancing the visual quality of the output from SPSS. For the Checklist data entry, I used the 'add-in' feature of Excel called 'Analysis Toolpak' (sic).

In using SPSS, it was essential to follow a systematic procedure of coding the variables/items, checking the accuracy and quality of the data entries and ensuring that the methods of analyses were appropriate. Three non-parametric tests available in SPSS were used in Phase One: The Spearman Rank Order Correlation, the Kruskal-Wallis *H* Test and the Mann Whitney *U* Test. Non-parametric statistics were incorporated because they do not assume that the data represent a normal distribution (Pallant, 2013); they are also particularly suited where the rating scale is ordinal (Bordens & Abbott, 2011) and for smaller sample sizes.

Non-parametric statistics were not used in the Case studies because the sample size of six participants was insufficient, compounded by the fact that I could not meet the assumption of independence (Field, 2009) due to two pairs of siblings being involved. In fact the presence of these siblings, owing to relationship, increases the Type 1 error rate, that is, there is a greater chance of obtaining a false positive, or incorrectly rejecting the null hypothesis (Field, 2009; Patton, 2002). The null hypothesis is a type of hypothesis in statistics that predicts that that there is no difference between the variables or groups being compared (Phakiti, 2014). The limitations to using non-parametric statistics in the Case studies meant that descriptive statistics were more suitable.

To assess for internal reliability, I measured the Cronbach's alpha coefficient (using SPSS) for the two rating-scale questionnaires, one which was used in Phase One and the other in Phase Two. This measure represents the "average correlation" of the number of item scores in any or all of the questionnaire subscales (Cooksey, 2007, p. 299). It is a measure of internal reliability or consistency (Pallant, 2013).

3.5. Research context

The research was conducted in a Roman Catholic primary school in New South Wales called St Michael's. (St Michael's is a pseudonym.) The population of the school is approximately 320 children, the majority born in Australia. There are a relatively small number of children whose parents have ethnic links to other countries, particularly Lebanon and South Korea. The children of the school are mainly from a high socio-

economic background; thus many have exposure to opportunities and resources that support the school's endeavour to provide a holistic and enriching education.

As would be expected of schools in any socio-economic area, there is a percentage of children who have high learning potential but there are also children with a diversity of learning difficulties. The School's NAPLAN results reveal a generally average to above-average level of achievement as compared to other schools in the Diocese and the State of New South Wales.

The school is two-streamed, meaning that there are mainly two classes for each year level. The classes have children of mixed ability. The child participants/subjects were selected from Years 2 to 6. Class distributions and also the average number of children and percentage of boys and girls for each year are shown in Table 3.2.

Table 3.2: Classes at St Michael's (2013)

Year	Number of classes	Average size of classes	Average percentage of girls to boys	
			Girls	Boys
Kindergarten	2	24/25	53	47
Year 1	2	28	48	52
Year 2	2	28	50	50
Year 3	2	28	51	49
Year 4	2	26/27	60	40
Year 5	1	28	61	39
Year 6	2	17 /18	74	26

The parents of St Michael's have high expectations for their children, which manifests in strong parental interest in the opportunities that the school provides – academically, socially, culturally, spiritually and physically. As part of the high expectations for their children, a number of parents move their children to private schools before they reach Year 6. In some ways St Michael's can almost be seen as a 'feeder' or preparatory school and Table 3.2 shows the decrease in ratio of boys to girls in the later years of primary school. Amongst the dilemmas that this situation creates for St Michael's is the gender imbalance in the Stage 3 classes (Years 5 and 6). In Year 5 in 2013, 39% of the class were boys and, in the combined Year 6s, only 26%. This latter point is of particular interest to the Study, because most of the selected Stage 3 participants are from the relatively small group of boys. The sampling procedure for selecting the participants is described in Chapter 4. Although the Study does not assume that these boys are 2e, a significant gap

has been found in reading achievement in the countries of the Organisation for Economic Co-operation and Development (OECD, which includes Australia) in their Programme for International Student Development (PISD) with 15-year-old girls significantly outperforming boys (Thomson, 2011). It was, therefore, of interest to see if this gap was observable in this small sample of younger children within the context of the Study.

3.6. The role of the researcher

The role of the researcher was multi-faceted; of particular importance to this research method was informing and consulting with the stakeholders, including administrative, teaching staff and parents of child participants, and child participants. (In the Glossary the children are noted as subjects in the TCQ trial and participants in the Case studies.) In Phase One, I liaised with teacher participants and my role was one of organiser, facilitator, interviewer, and communicator. Phase Two mainly involved interactions with the child participants so at all times it was essential to ensure that the children not only were comfortable with the assessment procedures, but also felt encouraged and had a sense of achievement. As part of this process, in the interview sessions the children all had the opportunity to operate the voice recorder.

Regular communication was maintained with the Coordinator: High ability/Gifted and Talented at the CSO, as well as with the School Principal and Assistant Principal. At the conclusion of the research phase, a progress report was prepared for the Principal, and the Assistant Director – School Improvement, and Coordinator: High ability/gifted, of the CSO. As part of a PAR cycle, I incorporated time for reflection during and at the end of Phase One with the co-researchers, and the other teacher participants. In effect and as previously indicated, Phase One represented one cycle of PAR. Three meetings were held at the CSO for communication purposes. It is imperative that as the researcher I created opportunities for reflection/discussion about the outcomes and implications.

3.7. Ethics and informed consent

A high standard of ethical conduct was adhered to in the Study, in the form of compliance with The University of New England's Higher Research Ethics Committee's approval (HE13-119), as well as conducting the research in a manner that was appropriate as a member of my supervisory team. In terms of the Diocese and school in which the research was conducted, it was imperative to work with professionalism. In working with the

teachers of the school, anonymity and confidentiality were observed and there was sensitivity to time and work pressures. The child and parent participants and subjects were also non-identifiable and any session with a child was always within sight of another adult. Ethical considerations also applied to use of the school site, its resources and to existing programming and timetabling arrangements.

In terms of the ethical consideration of reciprocity for the participants, the key benefits centre on developing a checklist questionnaire which may be useful to teachers, following its necessary future trialling. For the child subjects and participants, there was the opportunity of having not only their possible abilities/needs identified, but a greater chance of receiving appropriate intervention – akin to the desired goal of emancipation. For the six children in the Case study, accessing their views or 'student voice' further enhanced this possibility. These benefits would of course also be of vital importance to the parents.

3.8. Validity and reliability

Meaningful research requires that a reader is convinced that the study satisfies the criteria of being valid and reliable. Qualitative researchers do not generally use the terms 'valid' and 'reliable', preferring instead credible, transferable, dependable and confirmable (Guba & Lincoln, 1981). This view is also supported by Gavin (2008). However, the quantitative terms are used but are discussed below in relation to their qualitative as well as their quantitative interpretation.

3.8.1. The question of validity in a relatively small exploratory study

For the findings of a study to have credibility, it is essential that they are scrutinised for both their validity and reliability. This investigation is necessary to examine whether the data-collection procedures are rigorous, and also that their measurements actually reflect what is being measured (Punch, 2014). These requirements alone mean that this exploratory research study would need the rigours of further testing before a true estimation of reliability and validity could be determined.

The question of validity in a Mixed Methods Research approach requires that it is considered from a qualitative as well as a quantitative perspective. Qualitative

validity/credibility refers to considerations of the accuracy of the data (Creswell, 2009). Methods such as member checking, which in the case of the Study involved multiple teachers checking all transcriptions of interviews for their accuracy is a form of typical "qualitative validation" (Creswell & Plano Clark, 2011, p. 211) or confirmability. Another approach, which utilises other procedures to substantiate the data, is commonly known as triangulation.

The term 'triangulation' often accompanies mixed methods, because it is through using a number of qualitative and quantitative data sources that more understanding/insight is possible (Denzin, 2012). However, it is important to note that the prime intention of triangulation is not to corroborate or validate findings but rather to explore the data of each procedure so that together the understanding is more in-depth (Bazeley, 2002). Triangulation, however, as noted can also be used as a strategy for ensuring that the study is more credible or valid (Creswell, 2009). An instance of the importance of this strategy is raised by Denzin (1989) who suggests that through using triangulation, it can limit the possibility of researcher bias that may arise from using one type of methodology. The present Study incorporated the dual function of triangulation, both seeking more in-depth knowledge and simultaneously checking credibility.

The types of validity pertinent to quantitative research and therefore also relevant to MMR are 'construct', 'content' and 'external validity' (Punch, 2014). Construct validity refers to how well the items being measured relate to other items or variables in terms of the overriding construct (Babbie, 2011). This necessity was addressed in the Study by utilising the Cronbach's alpha statistic for the questionnaires. Estimates of content validity are based on how well the items or variables in a questionnaire cover the range of possible measurable meanings within the construct (Babbie, 2011). The Study's focus on developing a comprehensive identification questionnaire is an example of endeavouring to validate content. External validity often is referred to as generalisability or for qualitative assessments as "particularity" to the research context (Greene & Caracelli, 1997, p. 13), which is also acknowledged by Creswell (2009). Bazeley (2013) equates generalisability with transferability. For the various types of validity, including generalisability, further study would be required to determine if the findings are indeed relevant or representative of what could be expected in a different population. This latter point is reinforced by the realisation that the validity of the PAR design in Phase One depends upon how well the procedures addressed the question centred on developing and implementing a possible

identification assessment tool for 2e children. This consideration would require an expansion of the present study. In terms of the Case-study findings, transferability, or generalisations, which is a relevant consideration of case studies (Creswell, 2009) as well as quantitative studies, would also depend on future trialling with the same assessment strategies.

There is a further type of validity that is relevant to both qualitative and quantitative methods and needs to be reviewed and that is the question of face validity. Face validity considers how well the wording of a variable or item reflects the meaning (Babbie, 2011). Although differences in individual perceptions are an ever-present reality in research, all items in the two questionnaires were reviewed to maximise clarity of understanding.

3.8.2. Reliability

For any research project, it is necessary to consider and, where possible, to measure the reliability of the tools of assessment. Reliability considers whether the assessment tools used or developed would achieve similar results if they were tested in a further study (Babbie, 2011). O'Leary (2004, p. 59) expresses this comprehensively: "Reliability is premised on the notion that there is some sense of uniformity or standardisation in what is being measured and that methods need to consistently capture what is being explored." For this reason, all assessment procedures involved careful scrutiny to ensure a strong dependable foundation for their possible future usage and of course subsequent testing for reliability. In qualitative reliability the main focus is inter-rater reliability where coding selected from interview data or open responses is checked by another coder besides the researcher (Creswell, 2009). The choice of using standardised tests whether in gaining insights into reading or mathematics, or general intelligence level, was an informed and reliable one, knowing that each instrument had detailed procedures for ensuring reliability through adherence to specified procedures of administration and scoring.

In all stages of the project, whether in Phase One or Two, there was an ongoing communication between teacher participants and myself as the researcher, ensuring that decisions were the most appropriate, whether for the development of the TCQ, or even in the selection of child participants. This interaction or collaboration was an integral part of the PAR design of Phase One and necessary to ensure that decisions made were reliable in terms of being as representative as possible of the views of teacher participants.

For the Study to be seen as credible, it has focused on building a secure platform that will allow more research to expand and clarify its methodology, its findings and its validity. To meet this expectation, all procedures of both selection and/or creation of data-collection instruments, as well as analyses are true to the standards expected of empirical research.

3.9. Summary of the research design

Mixed Methods Research, via the Research designs or frameworks of PAR and Case studies, was used as the basis for the exploratory research Study. This combination of methodology and research designs, together with research procedures, allowed the incorporation of both qualitative and quantitative data and assessment techniques to address the research questions. The underlying purpose was to provide a research vehicle suited to the primary school context for addressing the needs of the stakeholders and researcher alike to be more informed about initial identification strategies for possible 2e children.

The two phases of the Study addressed separate but related questions. Phase One employed the typical spiralling process of PAR, which promotes all the benefits of not only working in collaboration with other teachers to develop the TCQ, but enhancing the possibility that through collaboration more doors of opportunity could be opened for 2e children. Phase Two unfolded through the case-study approach and allowed for a more in-depth view of whether other strategies would support or question the TCQ and in so doing establish the importance of a comprehensive assessment protocol. Within both phases and within the framework of the Mixed Methods Research methodology, survey methods and standardised assessments were selected as instruments of data collection together with appropriate analysis procedures to best support this process. Strategies were also employed in the exploratory study as preliminary steps in determining reliability and validity. An overview of the Methodology, Purpose and Methods for the Study are found in Appendix 4.

The following chapter will outline the research methods or procedures used in Phase One of the Study to address the question, *What are the components of a comprehensive, useful checklist for the preliminary stage of identifying possible gifted/high-ability children with learning difficulties?*

Chapter 4. Phase One: Research Methods

Outwitted

> He drew a circle to shut me out Heretic, rebel, a thing to flout. But love and I had the wit to win: We drew a circle that took him in! (Edward Markham, Quatrains, cited in Renzulli, 2005, p.14)

The Participatory Action Research framework (PAR) was used in Phase One of the exploratory study. Phase One represents one cycle of a PAR design and typically comprises three stages (Dick, 2002; Ferrance, 2000; Kelly, 2005), which include:

1. The reconnaissance stage (Maxwell, 2003; Mills, 2011) consisted of identifying the particular need, or situation, researching the literature about the traits of giftedness with learning difficulties, and determining the perceptions of teacher participants.
2. The action stage of PAR unfolded through the development and trial of the Likert-type identification Teacher Checklist Questionnaire.
3. The reflective stage involved – analysing both quantitative and qualitative data and reflecting about the findings and possible directions for further research (Mills, 2011).

As indicated in the previous chapter, Phase One has two sub-phases, one being the Development sub-phase (Teacher Checklist Questionnaire Development TCQD), which represents mainly the PAR reconnaisance stage and part of the action stage; and the other the Trial sub-phase (Teacher Checklist Questionnaire Trial TCQT), which is also relevant to the action stage and the reflective stage.

The research question, sub-phases and mixed methods of Phase One are illustrated in Figure 4.1. The methods connected to each sub-phase were implemented over a period of two school terms in the primary school site at which I have taught for many years. Information was provided for all the administrative and teaching stakeholders (the Catholic schools Office, School principal and staff members), seeking to enhance understanding and identification of gifted/high-ability children with learning difficulties (GLD, 2e). For re-clarification, the term ‘high ability’ is included with the term ‘gifted’ because unless there is a formal identification, then high ability is the more apposite term. The methods connected to each sub-phase, TCQD and TCQT, are outlined in the order shown in Figure 4.1. Methods A to C are all relevant to the TCQD because each represent

a link to the development of the Teacher Checklist Questionnaire (TCQ). The TCQT sub-phase incorporates the Trial (D) and analyses (E). The efficacy of the methods used is reviewed in Chapters 5 and 6. The following methods or procedures are described in "Research-Question Order" (Glatthorn & Joyner, 2005, p. 187), which is the clearest and most logical way of outlining their sequential development and supporting future replication for verification purposes (O'Leary, 2004), allowing for the subjective nature of the qualitative procedures and responses.

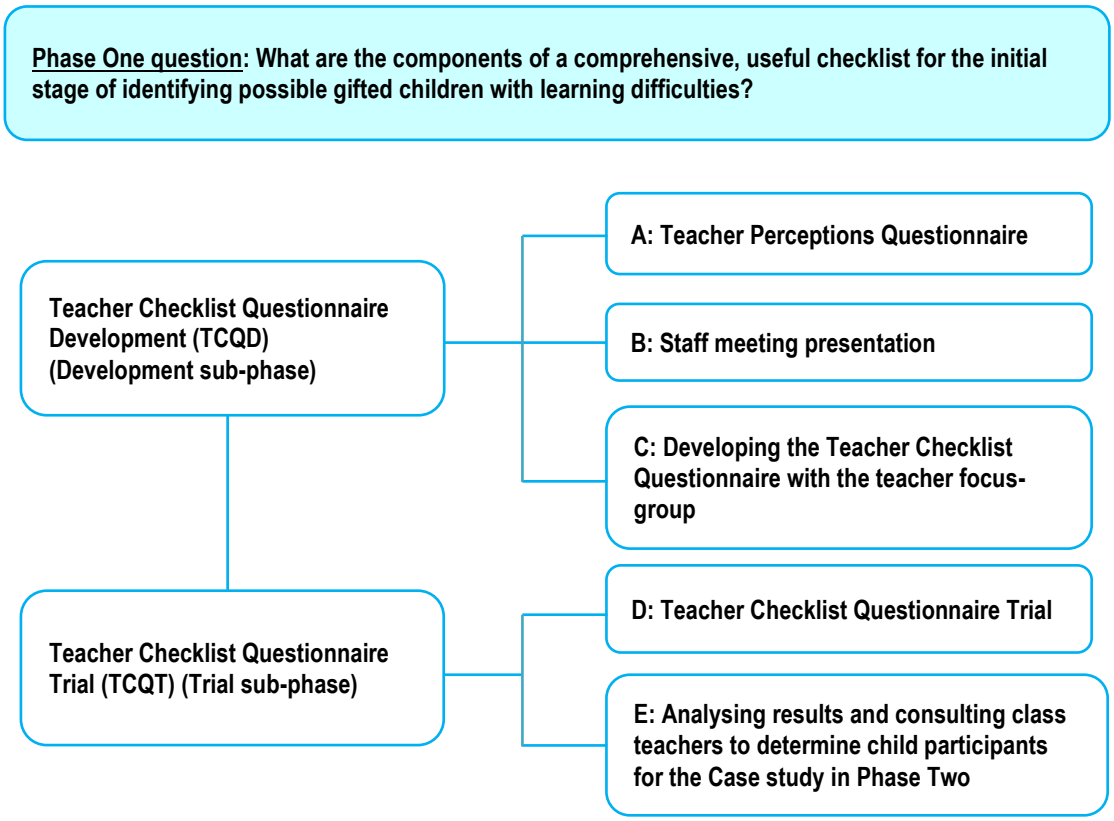

Figure 4.1: Overview of the mixed methods of Phase One via Participatory Action Research.

4.1. TCQD (A): Teacher Perceptions Questionnaire

As no similar tool is publicly available, I developed the Teacher Perceptions Questionnaire (TPQ), (Appendix 1) shown in the first Development sub-phase of Phase One above, after researching the literature for twice-exceptional traits that, where available, were research-based, referred to in secondary sources, or reported by experienced teachers. Its purpose was to establish the foundation of the Study and to determine teacher views about the key concepts of giftedness and learning difficulties, either based on their prior experience/knowledge or offered in response to a vignette of a

possible GLD (2e) child. It needs to be noted that the teachers had prior exposure to the needs of gifted children through a school professional development focus and they generally had some awareness of the existence of children who may have high ability simultaneously with one or more learning difficulties. In the school at the time there were several children who had very high ability as well as profound learning difficulties in specific areas and of whom the staff members were aware. It would be reasonable to assume, however, that the teachers were not familiar with the broad diversity of 2e. The other school focus at the time that drew specific attention to children's varying abilities was a request by the Catholic Schools Office (CSO) for teachers to compile a list of children whom they felt were high achievers and a list of children who appeared to be underachieving – based upon bi-annual standardised test results in literacy and numeracy.

In responding to the TPQ, the teachers were invited to reflect on both the existence of GLD (2e) and dilemmas of identification, particularly in the light of evidence suggesting that teachers are not always accurate in identifying the traits of GLD (2e) children, (Wormald, 2009). Discrepancies in teacher views can, of course, be influenced by numerous factors, including their level of knowledge and experience of the diverse traits of GLD (2e) (Karnes, Shaunnessy, & Bisland, 2004), as well as the challenges of identification where high ability or giftedness and/or learning difficulties may be hidden or masked (Munro, 2002; Silverman, 2009b; Wormald, 2011b).

The TPQ is largely open-ended, providing opportunity for respondents to record their perceptions. On the explanatory page, information is sought about years of teaching experience and pre-service training. As indicated, I included a vignette of a possible GLD (2e) child in case any teacher respondents required clarification or a reference base before reflecting and recording the possible traits of GLD (2e). The next section of the TPQ invites responses about teacher perceptions of possible GLD characteristics (Munro, 2002; Neihart & Betts, 2010; Ruban & Reis, 2005; Silverman, 1989) under the seven focal areas or categories:

- Strengths;
- Learning difficulties;
- Work application;
- Achievement on standardised tests;
- Talking and listening skills;

- Emotional indicators; and
- Other characteristics.

In the diverse and complex field of 2e, children's strengths and learning difficulties in the classroom may be reflected in inconsistent standardised test results, issues in listening, level of attention and work application (Silverman, 1989), and emotional and behavioural needs, which typically arise from high levels of frustration (Neihart & Betts, 2010). The last category, Other characteristics, allows teachers the opportunity to note any further observations. Space for optional comments (with the example, "your view about the suitability of the term gifted") was provided to enable teachers to offer their insights about these categories and encourage reflection about 2e. In the subsequent process of developing the initial identification questionnaire, that is the Teacher Checklist Questionnaire (TCQ), with the teacher focus-group, the views of the TPQ respondents would be valuable for comparison, particularly if there was reference to a possible trait/s not found in the literature.

4.1.1. Sample

The sampling method could best be described as purposive sampling (Babbie, 2011) because it understandably sought the views of the teachers in the school. The teachers, in effect, were a subset of a wider population.

4.1.2. Method

The invitation to participate in the Study together with a copy of the TPQ, were circulated in a Staff Memo. Of the 11 teacher responses there were nine of 14 class teachers and two of two specialist, learning support staff which gave a total response rate of 69%.

4.1.3. Data analysis

The data consisting of the participants' recorded perceptions were transcribed and coded into themes under each of the seven focal areas/categories described above (Appendices 5 to 11). The coding was checked for inter-rater reliability by two independent teachers. (The predominant themes noted in all categories appear in Appendix 12.) Data on years of teacher education and whether there had been exposure to specific training and experience were tabulated (Chapter 5, Table 5.1). Optional responses to open questions from the last

page of the TPQ were also tabulated (Chapter 5, Table 5.2) with particular note of teachers' views about the term 'giftedness'.

Following 'reading' and initial coding of the data, I used NVivo qualitative data analysis Software (NVivo) (QSR International) and imported the categories and related data. The purpose was to utilise NVivo's Query and "visual analysis" options to gain further insights and for comparison to the initial coded data (Edhlund & McDougall, 2016, p. 337). I used the software's Word Frequency Query to further refine underlying themes and the Matrix Query to compare the themes in each category. As noted in the Literature review, the concept 'learning difficulties' incorporates a prevalence of learning issues (Elkins, 2000) so I reviewed whether there were any common themes in the related categories (including Learning difficulties, Work application, Emotional indicators and Talking and listening skills). Because the labelling options for the NVivo charts are not completely compatible with APA style, I exported the data into Microsoft Excel to utilise its more suitable graphical features. Graphs showing the main themes and comparisons are included in Chapter 5, Section 5.1.

4.2. TCQD (B): Staff meeting presentation

The staff discussion was an essential part of the reconnaissance phase of the Participatory Action Research cycle. The aims of the staff meeting presentation were i) to discuss the purpose of the Study, ii) to enhance staff awareness of the existence and needs of GLD (2e) students, and iii) to receive any teacher nominations of possible students who may qualify for the Study.

4.2.1. Participants

Out of a possible total of 20 staff, eighteen were present, including the Principal, Assistant Principal and, in addition, my presence as the researcher. All staff gave written consent to participate and to have their views audio recorded.

4.2.2. Method

Following a Microsoft PowerPoint presentation (see the slides and accompanying notes in Appendix 13) and a review of typical traits of GLD (2e), discussion centred on whether any teachers may have possible 'hidden' or 'invisible' GLD (2e) children in their classes

who may warrant inclusion in the Study. Teachers may suspect such children to have high ability, but be uncertain due to inconsistent achievement levels. Hidden GLD (2e) children may have non-remarkable class results and may not feature in either upper or lower extremes of standardised test results, but nevertheless may reveal high ability in other areas, such as abstract verbal skills. Children identified here would be considered for the third group for the Teacher Checklist Questionnaire Trial, subject to receipt of both their parents' and their own consent. The other two trialling groups were selected mainly from the children's standardised test results, and consisted of children with high standardised test results. One group had no evident learning difficulties, while the second possibly did have learning difficulties. The third group contains the 'possible but invisible' GLD (2e) children. The composition of the three groups is explained in Section 4.4.1.

4.2.3. Data collection

The main data received were the teachers' nominations of possible hidden GLD (2e) children in their classes and there were also views expressed about the word 'gifted'. The names of 'identified' children were given to me as the researcher, and the two comments about the term 'gifted' were transcribed from an audio-recording of the session.

4.2.4. Outcome of Staff meeting

Teacher perspectives on giftedness were included for analysis with the optional responses from the TPQ (see Chapter 5, Section 5.1.2). The names of the six nominated students were included in the invitations to participate in the Study (detailed in Section 4.4.1.).

4.3. TCQD (C): Developing the Teacher Checklist Questionnaire with the Teacher focus-group

Although there are a number of lists of possible twice-exceptional characteristics, for example, Montgomery, (2015); Nielsen, 2002; Potential Plus UK, (2014-2017), Rogers, (2011), none met all of the criteria of (i) reflecting determined categories in both strengths and difficulties, (ii) clarity of meaning, (iii) minimal use of 'labelling' language, and (iv) user-friendly access for teachers, particularly in administering and scoring. Development of a checklist questionnaire meeting all of these criteria, and providing opportunity for teachers to add information and insights, was undertaken in this sub-phase of the study.

The TCQ was devised on the basis of published literature and teacher experience. The issue of qualitative validity was addressed by development of a comprehensive list of 2e traits from the research literature and checking item suitability with a teacher focus-group of experienced 2e teachers. Member checking and communication are vital components when considering qualitative validity (Creswell, 2009). Quantitative validity was determined by measurement of whether the items reflect the categories or constructs (Creswell, 2009) identified from the literature. As well as checking the scale reliability of the TCQ, thereby assessing usefulness as a measurement tool, its practical usefulness for teachers in terms of gaining information about the child or children being reviewed was also investigated.

4.3.1. Teacher focus-group participants

The teacher focus-group, or co-researchers, comprised two teachers who had both teaching experience and a keen interest in 2e, and me as the facilitator. One of the teachers was a learning support teacher who focused on curriculum modifications, practical teaching strategies, and organising enrichment classes for 2e children. The other had completed a post graduate degree in gifted education, including 2e.The teacher focus-group met for five sessions and each one lasted approximately 45 minutes. Appendix 14 has an example of a typical agenda and Appendix 15, a transcription record.

4.3.2. Method

Prior to this preparation and dialogue phase, available literature was examined for characteristics that were relevant to both giftedness and learning difficulties (Potential Plus UK (2014–2017); Bees (2009); Montgomery (2009, 2015); Nielsen (2002); Rogers (2011); and Silverman (1989). The authors are highly experienced in the field and at least three (Montgomery, 2009; Nielsen, 2002; Silverman, 1989) have acknowledged various primary sources for the particular selection of characteristics chosen. It is not clear whether all the characteristics noted by the authors are research-based, but where indicated, they were included in the TCQ. Items that appeared to be anecdotal but were found consistently across the literature were also incorporated. In Appendix 16, the sources for all items for the TCQ categories are listed under Research/evidence-based and Anecdotal or unspecified primary sources. In the Study, the use of research or evidence-based is where an author/s directly refers to a primary source, which may be from their own study or that of another researcher/s. The term ‘anecdotal’ is often used to denote text

with no evidential support, but in some cases, depending on the context of the paper, authors may base their insights on primary sources without including a citation, hence the reason for adding ‘or unspecified primary sources’.

Prior to the teacher focus-group sessions, I had collated the researched characteristics into the nine categories of the TCQ, which allowed time for perusal, discussion and any adjustments. Where there appeared to be ambiguity or a compromise of face validity, examples were included to assist teachers in their decision making. For instance, in the Other behaviours section of Section B, the example “low muscle tone affecting posture in sitting, drawing and handwriting” was added to the item “Has fine motor/co-ordination issues”. Another important point is that the items in Section B, which focus on learning difficulties, were expressed in a more neutral language to minimise the negative connotation that can arise from premature ‘labelling’ of children. For example, rather than seeking a teacher’s response about a child’s negative attitude towards school, the item is expressed in the TCQ as, “Can show an indifferent attitude about school, or lack of engagement in school work”.

During the development of the TCQ, the main traits noted in the Teacher Perceptions Questionnaire were reviewed and were found to be covered by items selected from the literature sources. Following the completion of the list of characteristics, the teacher focus-group revised and amended the TCQ to enhance clarity of meaning, particularly apropos of reading, mathematics and learning difficulties.

The teacher focus-group agreed that there should be two sections in the TCQ, the first of which, Section A: Indicators of Learning Potential, would focus on possible gifted/high-ability potential and be based on the six natural-ability Domains of Françoys Gagné’s Differentiated Model of Giftedness and Talent (DMGT, revised 2007-2008), often referred to the DMGT 2.0, (Gagné, 2010, p. 83). The model is widely known and generally accepted in Australia, as well as internationally. Although the ability domains are identical in Gagné’s Expanded Model of Talent Development (EMTD) (Gagné, 2013) this later model is not formally acknowledged in state or territory official documentation. Further supporting the use of the DMGT 2.0, the Australian Curriculum, Assessment and Reporting Authority (ACARA, n.d.-b, *Gagné’s model*, para. 2), which manages and develops national curriculum standards in specific key learning areas, advises in its website Diversity that “In Australia today Gagné’s model provides the most generally

accepted definition of both giftedness and talent … and provides research-based definitions of giftedness and talent that are directly and logically connected to teaching and learning". It was felt that including the six Domains in Section A, namely Intellectual, Creative, Social, Perceptual, Muscular, and Motor control, would allow for the possibility that child subjects may show high potential in any one or more of the Domains. (Henceforth the term 'categories' will be used instead of domains, to be consistent with Section B of the TCQ.) In schools, there is more focus on the Intellectual category, particularly in the light of developing academic skills. However, by including the other five categories in the TCQ, there was the opportunity for teachers to consider other possible areas of giftedness, which could lead to the initial identification of a greater number of very able children. Several of the categories had few items, such as Muscular and Motor control, but again their inclusion was for the purpose of flagging the reality that giftedness may not be confined to the Intellectual category.

For Section B of the TCQ, Indicators of possible learning difficulties, the teacher focus-group felt that there should be three categories of particular relevance to a school context. These are Academic difficulties, Socio-emotional difficulties and Other behaviours. The first two categories are self-explanatory and Other behaviours comprised traits that were considered to be in a separate category of their own.

During the teacher focus-group discussions, the question of 'over-excitabilities' (OE) was posed as a possible characteristic to be included in Section A of the TCQ. The five forms of overexcitabilities, namely "sensual, psychomotor, imaginational (sic), intellectual, and emotional" (Mendaglio, 2012, p. 208) are linked to Dabrowski's theory of positive disintegration (TPD) (Dabrowski, 1964, 1967). However, F. Gagné (personal communication, August 10, 2013) indicated that he would not classify over-excitabilities as gifts and would refer to these attributes as Personality traits, which are included under Mental traits in the Intrapersonal (I) catalysts sub-component of his Model. (A copy of the DMGT 2.0 and the EMTD is found in Chapter 2.) In the DMGT 2.0 and the EMTD, the sub-components Intrapersonal and Environmental (E) are shown as catalysts that can assist or hinder the development of giftedness into talent. The teacher focus-group decided, therefore, that they would not incorporate OE in Section A of the TCQ.

The term 'giftedness' was also discussed by the teacher focus-group, and although the teachers much preferred the term 'high potential', they recognised that as Section A of the

TCQ was based on Gagné's model, it would be appropriate to use the word 'gifted'. Not all teachers respond to the term 'gifted' or 'giftedness', so the explanatory page accompanying the TCQ includes several alternatives which may have wider acceptance, such as 'significant learning potential' or 'high ability' or 'gifted potential'. The other reason for including 'high ability' in the title of the research project is that the CSO, which is the school site's employer, uses the term 'gifted/high ability' with the likely explanation that high ability can be an indication of giftedness, subject to formal identification.

Each item in the TCQ can be rated using a 6-point Likert scale, comprising the descriptors – Not Applicable, Not Observed, Uncertain, Sometimes, Often and Always. (I am defining a Likert scale as a series of Likert or Likert-type items where the scores are combined to "provide a quantitative measure" of the particular construct/category (Boone & Boone, 2012, p. 2). Likert-type items refer to items where the ranking options are not identical to the original Likert response options but there is some similarity (Clason & Dormody, 1994). For example, in the TCQ the use of the descriptors Uncertain and Always are related to the Likert terms Undecided and Strongly approve. During the analysis, as a 6-point scale implies, a response for each ranking was given a score from 1 to 6, with the smallest number designated to Not Applicable and the highest to Always. The choice of the descriptors is important, for example, Uncertain allows for the situation where the characteristic may have been detected occasionally and the respondent is not sure whether this was a typical feature or random occurrence. The other descriptors, Not Applicable, Not Observed, Sometimes, Often and Always are more self-explanatory.

A further component was added to the TCQ, consisting of a section at the end of each category for optional open responses with the heading Other observations/comments. (Refer to Appendix 17.) Closed-ended and open-ended questions can complement one another (Esses & Maio, 2002), which in terms of the TCQ would mean the possibility of collecting more in-depth data that yield both specific responses to a predetermined rating scale, and optional teacher notes/perceptions about each child.

4.3.3. Preliminary testing of the Teacher Checklist Questionnaire

The content of the TCQ underwent a collaborative and continuous review throughout the six teacher focus-group sessions. Three members of the teacher focus-group, including me as researcher, did a preliminary check of the TCQ prior to the trialling phase. We

randomly selected an anonymous child and using a copy of the TCQ, ranked him/her on all of the items. It was felt that this procedure would allow for any last-minute adjustments, particularly if there were any missed ambiguities. The results of this check reported in Chapter 5, were analysed by discussion with the teacher focus-group.

4.4. TCQT (D): The Trial of the Teacher Checklist Questionnaire

In the second sub-phase of Phase One (the Trial), the TCQ, together with its explanatory information (Appendix 2), was trialled by all 10 teachers from Years 2 to 6, including eight full-time teachers and also two job-share teachers from one of the Year 3 classes. The procedure involved ranking the selected child subjects in their class on all the category items. The purpose was to investigate (i) the suitability of the combination of items, (ii) the efficacy of the TCQ and (iii) provision of an opportunity for teachers to gain experience and insight using an initial assessment strategy for identifying the strengths and needs of potentially 2e children. Each of the teacher participants completed between one and four TCQ assessments.

4.4.1. Selecting the child subjects

Child subjects were selected according to two criteria: their standardised test results, mainly in reading, and their teachers' perceptions. I explored the children's results for the period 2011 to early 2013, looking for any trends that may indicate high ability, discrepancies or conversely, learning difficulties. The test results that were reviewed were:

1. TORCH: Tests of reading comprehension (Mossenson et al., 2003);
2. South Australian Spelling (Westwood, 2005);
3. Progressive Achievement Tests in Mathematics (PAT Maths) for Years 3 to 6 (Stephanou & Lindsey, 1997);
4. Burt Word Reading Test (used by Years 1 to 2) (Gilmore, Reid, & Croft, 1981);
5. Diagnostic reading and spelling tests 1 & 2(Waddington, 2000); and
6. Mathematics Diagnostic Test Series (Scaffold Education, 2003).

In 2013, the school began to use online testing and results from the following tests were also reviewed:

1. ACER PAT Maths Plus(Stephanou & Lindsey, 2010);
2. PAT R-Comprehension (Stephanou, Urbach, & Anderson, 2008b); and
3. PAT R-Vocabulary (Stephanou, Urbach, & Anderson, 2008c).

The school standardised-test results for the children selected for the Checklist Trial (TCQT) are in Appendices 18 (Years 1 to 3) and 19 (Years 4 to 6). These results determined which children may be suitable subjects, particularly where results represented a contrast or verification of class results. Where available, children's results for the ACER General Ability tests (AGAT) were also considered. Year 2 children had been assessed by the School using AGAT. The test assesses i) verbal, ii) numerical, and iii) abstract reasoning skills (Stephanou, Butler, Urbach, & Anderson, 2008a).

Possible candidates were reviewed with the teacher focus-group and also with each child's class teacher. I felt that the class teachers, who had been teaching the children for three school terms, would be aware of their general abilities and/or needs based on class assessments and observations. (In New South Wales there are four terms in a school year.)

Invitations to participate in the Study were sent to the 48 selected children (including the six nominated children from the Staff meeting presentation) and their parents. There were 29 responses which resulted in a total of 24 child subjects. The remaining five could not be included because their consent documents were received after the commencement of the Trial. Therefore, the total response rate was 60%, with 50% being involved in the Study.

The child subjects were assigned to one of three groups for the TCQT as follows:

> Group 1: High standardised test result mainly in reading, but selection could also be based on a high standardised mathematics result;
> Group 2: Above-average to high standardised test result as per Group 1, but may have a learning difficulty; and
> Group 3: Possible hidden or uncertain abilities (low to average standardised test results) and may have a learning difficulty.

It is important to note that there was no assumption made that any of the child participants was gifted or GLD (2e).

The rationale for selecting the three groups was centred on the range of abilities and achievements that GLD (2e) children can present to teacher observation. These are as follows:

1. *High standardised test result group but with no evident learning difficulties*
   Children selected in the 'high standardised test result group' represented a quasi-control group (Ziegler, Schimke, Stoeger, & Merrotsy, 2010) in that they were readily identifiable for their abilities rather than any evident learning difficulties. I felt that this inclusion would assist in determining whether the TCQ did clearly reflect whether a child showed advanced abilities. In addition, there are 2e children who may score well in standardised tests and in primary school generally, but may have a masked Learning disability (LD) (McCoach et al., 2001), so including a group of high achievers had a dual role. It is possible, of course, that any child in Group 1 who may be a high achiever with a masked LD may still not be detected for their needs in the trialling of the TCQ.

2. *Above-average to high standardised test result group who may have learning difficulties*
   Children in the second group, 'above-average to high standardised test result but may have a learning difficulty' were selected on the basis of class teacher perception that they were not achieving at their true ability level and may be limited by a possible LD. The teachers' views can reflect a tendency of some 2e children who, as indicated, can achieve well in a standardised test result, but their class results may not reflect this level of achievement (Buică-Belciu & Popovici, 2014).

3. *Possible hidden or invisible GLD (2e)*
   Children selected for the third group of possible hidden or invisible GLD (2e) children were those where the teacher found it difficult to obtain a true picture of their learning capacity. They tend to achieve around the low to average range in class results (McCoach et al., 2001) and yet from time to time may tantalise their class teacher with a flash of brilliance. Due to the uncertainty about their true ability they can be described as the 'fence sitters' or 'invisible'. It is possible that these children may also have one or multiple LD, which may or may not be readily observable.

Altogether, there were 24 children available for the trialling of the TCQ: eight in Group 1, nine in Group 2, and seven in Group 3. Unfortunately, three children who were also candidates for Group 3 did not return their consent forms in time for the trialling. In effect, the children self-selected their participation which, unlike the mode of selection for the TPQ is not purposive selection.

4.4.2. Teacher participants and method for the Trial

The teacher participants for the Trial were from Years 2 to 6 and represented nine classes. There were eight full-time teachers and two part-time or job-share teachers. Each teacher ranked an average of two to three selected child subjects in their class. To compensate the teachers in terms of time given, I supervised their classes for a specified period while they completed the TCQ. Following clarification with each of the teacher participants of the procedure involved in completing the Questionnaire (second page of Appendix 2), they worked in a separate room and spent an average of 10 to 15 minutes on each questionnaire. Interestingly, a number of teachers gave their perceptions about the usefulness of the TCQ as a possible assessment tool in the classroom. These reflections were recorded and appear in Chapter 5.

4.5. TCQT (E): Data analyses of the Trial

The analyses involved mixed qualitative and quantitative techniques to best determine the components of a useful checklist for the initial identification of possible gifted/high-ability children with learning difficulties. To assist comprehension of all the procedures involved, graphics are used in this section.

4.5.1. Demographics of participants and subjects

The first phase of the inquiry involved an analysis of the relevant demographics of the teacher participants, and child subjects and their individual and group mean results. Procedures in this initial phase are shown in Figure 4.2. The description of the teachers included their gender, years of teaching experience, the current class being taught and training apropos of giftedness and learning difficulties. For the child subjects, details included their age, gender, Year and stage level, and their trialling group. The children's ethnic details were not tabulated to avoid possible identification, but reference will be made to ethnic background where it is relevant to consideration of factors influencing

results in literacy. This will be the case where one of the subjects, whose native language is Spanish, has only been in Australia for a few years.

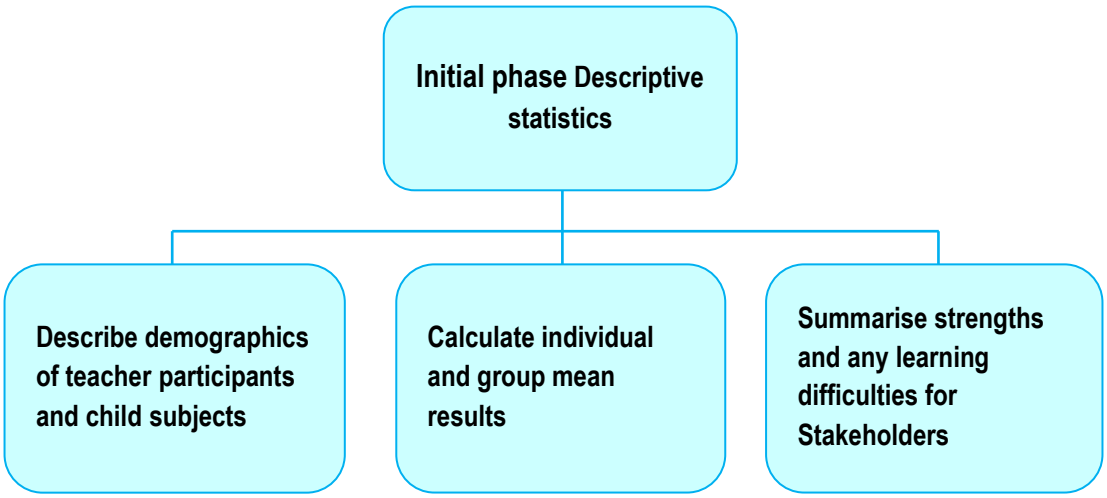

Figure 4.2: Initial procedures for analysing the Checklist result

4.5.2. Calculating individual and Trial group results

The descriptive statistics option of Microsoft Excel was used to calculate the children's results for each of the nine categories of the TCQ, including their total (Appendix 20) and mean results (Chapter 6, Table 6.2). The results represented all teacher observations including the two job-share teachers. As indicated previously, each TCQ descriptor was assigned a value between 1 (Not applicable) and 6 (Always). None of the scores in any of the categories required reverse scoring. Even though the descriptors in Section A of the TCQ are semantically different from the descriptors in Section B, reverse scoring Section B would only have been necessary if I had sought an overall score from the TCQ. The analysis was confined to reviewing the results of each category and correlations between the categories.

Each child's results were used to make a summary for the main stakeholders of the school including the School principal, staff and parents/care givers (Appendix 21). The purpose was to highlight possible strengths from Section A of the Checklist (Indicators of possible significant learning potential) and any areas in Section B (Indicators of possible learning difficulties) that may benefit from further teacher support. Providing this overview was part of the initial agreement on the Consent form documentation. Parents were also given the option in their documentation of receiving a verbal response about their child's results.

The parents of the school are familiar with being kept informed of outcomes, so a general, brief summary was provided verbally after consultation with and the approval of each class teacher.

The children's mean scores for the three groups were calculated using Excel (Chapter 6, Table 6.8). For group comparisons, I randomly selected out one of the two-job share teachers to ensure that data were obtained from 24 independent observations. (The procedure for comparing the two job-share teachers' observations is included in Section 4.5.5.2.) The individual and group results formed the basis for the preliminary investigation into the reliability and validity of the TCQ and its subsequent usefulness for primary school teachers.

4.5.3. Analyses of reliability and category correlations

To make a preliminary assessment of the validity and reliability of the TCQ (Figure 4.3), the computer software, IBM Statistics Pack for the Social Sciences (SPSS, Version 23), was used. This phase began with coding all the TCQ items and then entering them into SPSS with each child subject's ranked scores, which were based on the Likert scale. All results from the six categories of Section A and the three categories of Section B of the TCQ were analysed to determine internal consistency and category correlations.

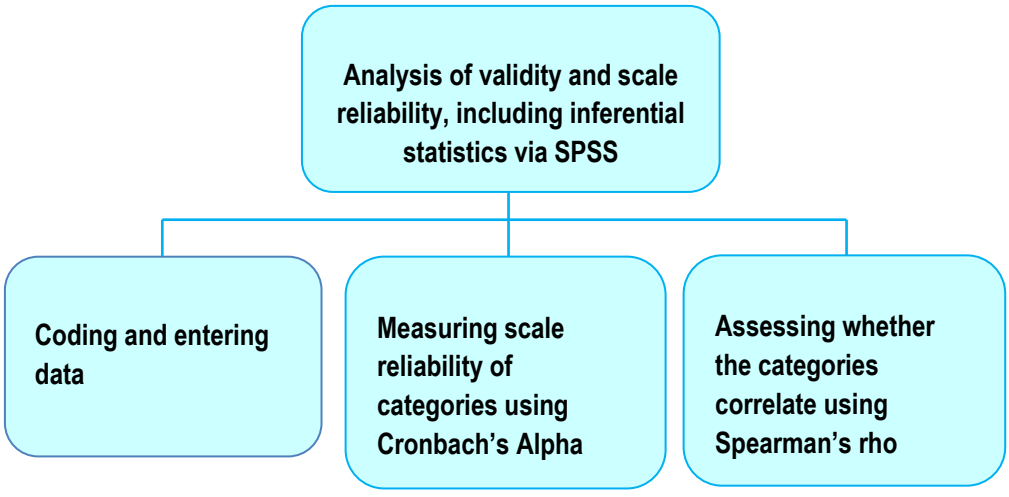

Figure 4.3: Procedures for reviewing validity and scale reliability

4.5.3.1. Investigation of scale reliability (internal consistency)

I investigated the internal consistency or scale reliability (Field, 2013) of each TCQ category or sub-scale using SPSS to calculate Cronbach's Alpha coefficient, henceforth

referred to as Cronbach's α. This measure essentially means reviewing how well the items reflect the "underlying construct" (Pallant, 2013, p. 101). Field's definition of content validity (2013) is very similar in meaning to Pallant's interpretation of internal consistency, so I consider the interpretation of Cronbach's α as essentially a measure of scale reliability, which has an association with content validity. To interpret the Cronbach α scores, there are 'values' available as a guide, for example, .7 and above being considered as acceptable (De Vellis, 2012; Pallant, 2013). However these guidelines can vary according to the type of test, and need to be viewed within the context of the study (Field, 2013) and the number of items in each category (Field, 2013; Pallant, 2013). For the exploratory nature of the study, I used .7 as a general guide. A further point to be made is that scores in the .9 to 1.0 range, although appearing to indicate strong reliability can, in fact, reflect the occurrence of items in a sub-scale that are very similar.

4.5.3.2. Inter-item correlations

In addition to reviewing internal consistency via Cronbach's α, I checked the inter-item correlations in each category to see if there were any items that were essentially measuring the same or a similar trait. This information is found in the Item-Total Statistics tables provided in the SPSS output (Appendix 22) under the heading Cronbach's Alpha α if Item Deleted. If the reliability score was improved or unchanged, removal of an item would be recommended to ensure a more efficient questionnaire.

4.5.3.3. Determining whether the categories correlate

A non-parametric test used to investigate the usefulness of the TCQ was Spearman's Rank Order Correlation (Spearman's rho) (see results in Appendix 23). Non-parametric statistics are particularly suited for questionnaires that use a ranking scale (Pallant, 2013), which is the case for the 6-point Likert TCQ. Spearman's rho was utilised to determine how well the categories correlated. In other words did the nine subscale categories fit together or complement one another in the TCQ? For example, the literature tends to refer to gifted/high ability children as often having intellectual and creative prowess (Gross et al., 2003; Renzulli, 2002) so it was relevant to see if these two categories showed a strong correlation in the results.

4.5.4. Exploring individual and group comparisons

After following the procedures to investigate scale reliability of the TCQ and whether there were correlations between the categories, it was necessary to explore and compare individual and group results. This focus is particularly relevant to the focus of the Phase One question regarding a useful tool for teachers for obtaining multiple insights about the child or children in the initial identification process. For instance, would teachers be able to observe whether there were categories indicating key strengths and/or difficulties, and if there were any observable patterns in each child's results? In addition, these comparisons were important for the Study in determining whether there was evidence of consistency between the TCQ rating scores and the criteria for the child participants' selection, namely their standardised test results and teacher perceptions. The procedures are shown in Figure 4.4.

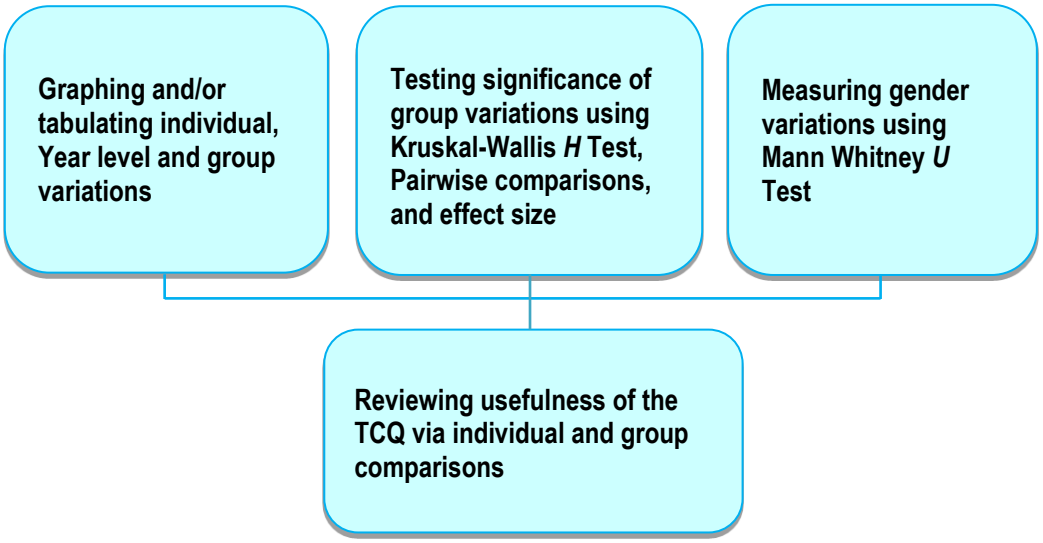

Figure 4.4: Procedures for individual and group comparisons to assess usefulness of the TCQ

4.5.4.1. Comparison procedures

The following sequence of quantitative analyses procedures, to investigate the ranking of the 24 child participants and variation in Year levels, as well as in and between the Trial groups, is illustrated in Figure 4.4:

1. *Graphing data in year levels* (using ranked data of all teacher participants) (Chapter 6, Figure 6.1)
   The mean scores obtained for the child subjects in each of the nine categories of the TCQ were graphed in year levels using Excel. From these visual representations,

which are a typical characteristic of mixed- methods studies (Teddlie & Tashakkori, 2010), individual trends as well as comparisons in each year level could be observed to illustrate the TCQ's functionality or usefulness as a tool for teachers

2. *Tabulating average Likert scores in Trial groups* (Chapter 6, Tables 6.7 & 6.8)
The average Likert scores were obtained from these individual graphs for each child and tabulated in their trialling groups to investigate similarities or differences within each group.

3. *Graphing group Likert scores* (teacher participants excluding job-share Teacher 2)
To compare the results between the three groups, the average Likert scores were then graphed to provide a clear picture of whether the TCQ was detecting variations in their strengths and/or needs in each of the nine categories (Chapter 6, Figure 6.2). I included standard error bars in this graph that "measure the error (or distance) between the sample mean and the population mean" (Gravetter & Wallnau, 2013, p. 216). Another way of expressing this meaning is, "the variability of scores around the estimate" (Bordens & Abbott, 2011, p. 401). As the results for this graph formed the basis of non-parametric statistical analyses it was necessary to satisfy the assumption of independence (Pallant, 2013) for the group comparisons, meaning that each child was evaluated once by one teacher. Hence the graphed results are the observations of the eight full- time teachers and job-share Teacher 1. Comparisons of the results of the two job-share teachers are presented in Chapter 6, Section 6.3.2.

4. *Using Kruskal-Wallis H Test (SPSS) to test for significance across the Trial groups*
The categories were further assessed using the Kruskal-Wallis *H* Test (SPSS) to determine if any of the differences were statistically significant across the groups (Appendix 24). It needs to be emphasised that the Kruskal-Wallis *H* test provides an analysis of whether the variations in the three groups collectively (or across the groups) show a significant difference, but does not indicate which of the groups may be statistically different.

5. *Pairwise comparisons*
To find out which groups may or may not be statistically different, I used the follow-up procedure, Pairwise comparison. This option also gives adjusted *p*-values based on the number of groups. (I was particularly interested to see the significance levels of groups showing greater variation in mean scores and simultaneously had an error

bar that didn't overlap.) When the same data are analysed more than once, it is necessary to adjust the *p*-values, or in other words to make them stricter. For group comparisons, if only the unadjusted significance levels were used there could be a 14% chance of a Type I error, meaning a false rejection of the null hypothesis (Field, 2013). This false assumption that the groups are different in terms of the categories being reviewed, could arise for instance if the difference between two groups is statistically significant, when in fact using a tighter *p*-value may show the difference to be non-significant and therefore the null hypothesis is not rejected.

6. *Effect sizes of the Pairwise comparisons*

   In addition to exploring the *p*-values of group differences, I also calculated the effect sizes, which are "descriptive statistics" (Morris & Fritz, 2013, p. 832) used to determine the magnitude of the association (Field, 2013) between each category (including the items or variables) and each of the three groups. This type of effect size is from the *r* family, which "covers various measures of association linking two or more variables" (Ellis, 2010, p. 11). The benchmarks of .1 indicating a small effect, .2 to .3 a moderate effect and .5 and above a large effect are used (Cohen, 1988). These *r* effect size estimates are used only as a guide, and need to be discussed within the context of the study (Field, 2013). Owing to the relevance of reviewing effect sizes (Ellis, 2010; Field, 2013; Morris & Fritz, 2013) it is recommended by APA that they are included in the analyses (American Psychological Association, 2010).

4.5.4.2. Differences in gender results

To ascertain whether amongst the 24 cases of the TCQ there were any gender differences showing up in any of the categories/sub-scales, I used another statistical procedure available in SPSS, the Mann Whitney *U* test (Appendix 25, including mean ranks in Appendix 26). Boys overall can feature more prominently in certain areas of LD, such as reading difficulties (Wheldall & Limbrick, 2010), so I was interested to determine whether there were any gender differences in the results.

4.5.5. Further findings related to teacher perceptions

The trialling phase provided further opportunity for data collection and analyses to enrich and expand the findings centred on teacher perceptions that were optional and in one case

fortuitously led to insights on the variations that can occur in teacher assessments. The following section details these sources and their analyses.

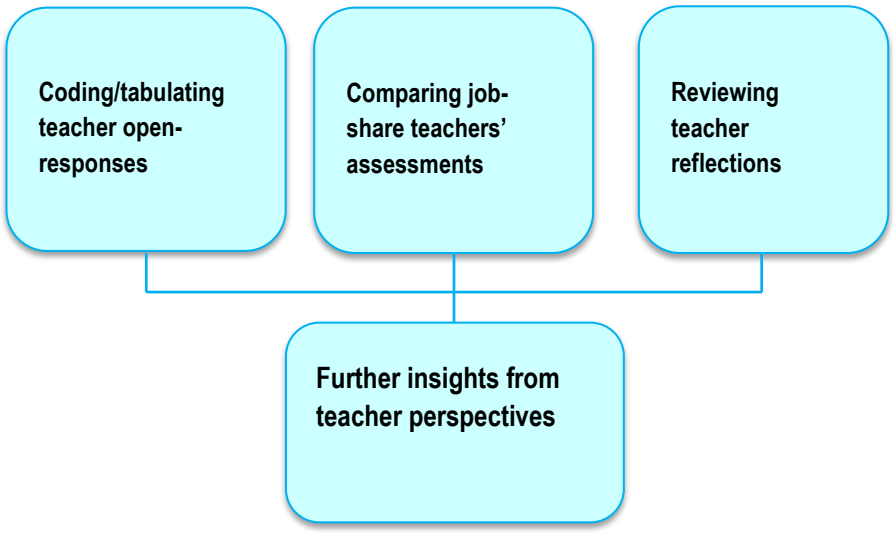

Figure 4.5: Other insights from other teacher data sources

4.5.5.1. Teacher Checklist Questionnaire open-response data

Another assessment of the TCQ's usefulness for teachers was reviewing its open-response data/notes. Teacher comments were coded and tabulated. It was important to check whether the format of the TCQ provided teachers adequate space to record their insight as a basis for further reference, for example as a discussion point with the Learning support staff or specialist support.

4.5.5.2. Investigating variations in job-share teacher assessments

It was noted previously that there were two job-share teachers who trialled the TCQ for the same two child subjects in one of the Year 3 classes, so it was important to review whether there were variations in perceptions. This analysis, although involving only two teachers, was useful in considering the impact of individual perceptions in the assessment of the 24 subjects. The teachers' individual scores were graphed together for each of the categories to compare similarities and differences.

4.5.5.3. Teacher reflections about the Teacher Checklist Questionnaire

Integral to a PAR design cycle is opportunity for reflection and teachers were given the option of providing verbal feedback following the completion of the TCQ. Responses were recorded and tabulated.

4.6. Summary

Phase One incorporated mixed methods in a PAR design that utilised a combination of qualitative and quantitative data collection and analyses methods. These mixed methods were linked to the two sub-phases of Phase One (the Development sub-phase and the Trial sub-phase). Phase One was largely exploratory and sequential, which is one of the typical types of MMR (Creswell, 2009). The open-ended TPQ was used to discern teacher perceptions of possible traits of GLD (2e) (based on either a vignette of a typical GLD (2e) child, or on his/her experience) and also to use as one of the reference points for the development of the TCQ. These results were analysed via content analysis to provide coded perceptions for comparison purposes. A staff-meeting presentation discussed the purpose of the study and explored possible traits of giftedness/high ability and learning difficulties. At the meeting there was a review of any children who may fall into the category of possible 'hidden' or 'invisible' 2e and whose standardised test results may have been non-remarkable. The meeting was audio recorded and transcribed and the names of possible children were listed by the teachers and given to me as the researcher.

A small group of teacher participants, or co-researchers, including myself, worked on developing an initial teacher checklist questionnaire based on research-based and anecdotal characteristics, as well as teacher perceptions. This procedure was pivotal to addressing the need for the assessment tool to be comprehensive. The emerging checklist questionnaire was reviewed over a period of six 45-minute sessions.

For the Teacher Checklist Questionnaire Trial, the participating Class teachers from Years 2 to 6 ranked selected child subjects in their respective classes on items using a six-point Likert scale. Using the raw scores, I prepared an overview sheet for the School principal and teacher participants, about the children's strengths and possible needs. A brief and broad summary of the results was communicated to the parents apropos of strengths, and areas that the teachers felt needed on-going focus.

To determine the TCQ's usefulness, both in terms of its validity and reliability and also subsequent practical usefulness for teachers, the data were analysed mainly using content analysis, descriptive statistics and the IBM Statistics Pack for the Social Sciences (SPSS, Version 23.0). The unfolding of these procedures was sequential.

The mixed methods of Phase One, which sought to identify both the components of a comprehensive and useful identification checklist, led to the collection and analyses of important data to provide the basis for addressing the central focus of the study. In each of the following two chapters the results are followed by their associated discussion to enhance comprehensibility. Hence these chapters are titled:

Chapter 5 Phase One: The Checklist Questionnaire Development (TCQD) – Results and Discussion

Chapter 6: Phase One: The Checklist Questionnaire Trial (TCQT) – Results and Discussion

Chapter 5. Phase One: The Teacher Checklist Questionnaire Development sub-phase — Results and Discussion

> There is nothing like looking, if you want to find something (or so Thorin said to the young dwarves). You certainly usually find something, if you look, but it is not always quite the something you were after. (Tolkien, 2006, p. 69)

This chapter represents a report of the analyses of data, and discussion connected to the Teacher Checklist Questionnaire development (TCQD sub-phase) in Phase One of the Study, apropos of the initial identification of possible gifted/high-ability children in the primary school. Generalisations arising from the analyses (Department of Social Cultural & Curriculum Studies University of New England, 1990) are made with the understanding that they are specific to the Study and cannot be assumed to represent a larger population. The tables and figures, typical of an outline of a study's results (Pemberton, 2012), show the most relevant analyses, whilst more involved and lengthy tables appear in the Appendices. To enhance the relevance and comprehensibility of the results, discussion follows immediately after the first two stages of the TCQD sub-phase:

A: TPQ – about children who may be gifted with a learning difficulty and

B: the Staff meeting presentation,

and then following the third stage C: Developing the TCQ with the teacher focus-group. The discussion will review the results in the light of the research question for Phase One, the theoretical foundation of the study, and key conclusions arising from the Literature review (Cole, n.d.) and explore the relevance and contribution of the three stages to the identification of twice-exceptional children in the primary school context. To support this process, a summary of the key Literature review conclusions and the related Study findings as well as the MMR methods employed, are tabulated at the beginning of each discussion section (adapted from Cornish, 2012). Furthermore, because this chapter covers the early developmental stage of the Study prior to its transition to 2e, references are made to GLD – with 2e in parentheses to indicate the progression to 2e.

5.1. TCQD (A): Teacher questionnaire – Perceptions about children who may be twice-exceptional (gifted with a learning difficulty)

The initial results of the TPQ appear in seven tables under the Questionnaire categories: Strengths, Learning difficulties, Work application, Achievement on standardised tests, Talking and listening skills, Emotional indicators and Other characteristics. These tables are in Appendices 5 to 11. A number of themes were coded from Other Characteristics (Appendix 11) into other relevant categories. The predominant themes in each of the categories are tabulated in Appendix 12. After preparing these tables the data were imported into NVivo qualitative data analysis Software (NVivo) (QSR International, 2015) and the themes identified, extended and supported those from the initial coding (Appendices 5 to 11). Therefore, I refer to both types of analyses with tables in the Appendices connected to the initial coding, and graphs in this section created in Microsoft Excel from the NVivo analysis.

The main themes identified in each of the categories (from NVivo and the initial coding) by the 11 teacher participants include:

1. Strengths (Figure 5.1, Appendix 5)

The predominant themes are thinking skills, oral language skills and a subject area, which includes numeracy noted in Appendix 5. There are also strengths noted to a lesser extent in an area of interest and creativity.

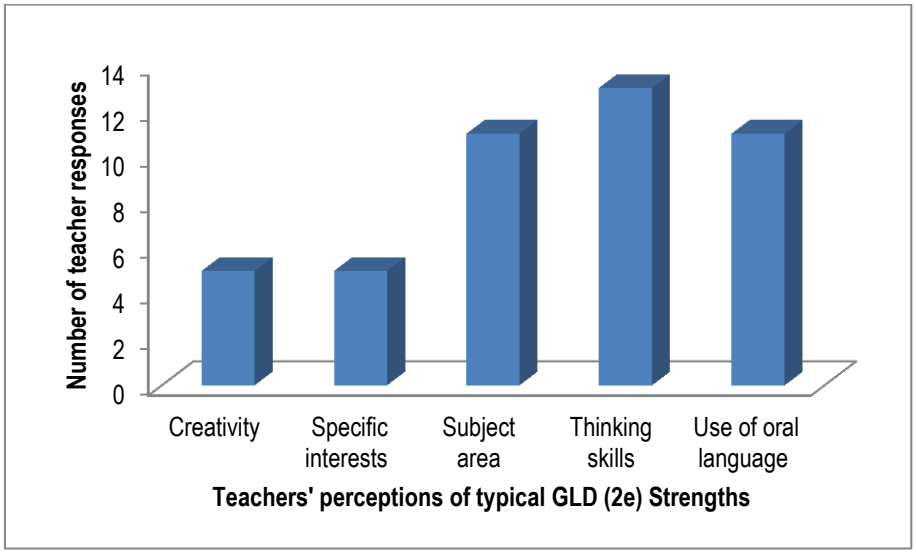

Figure 5.1: TPQ teacher respondents' perceptions of typical GLD (2e) strengths

2. Learning difficulties

The predominant issue identified from teachers' perceptions of learning difficulties (Figure 5.2 & Appendix 6), is handwriting coordination, which is likely to be associated with the other main theme of writing/written expression difficulties. Appendix 6 also notes Subject area as a key theme which in relation to Figure 5.2 includes spelling and reading.

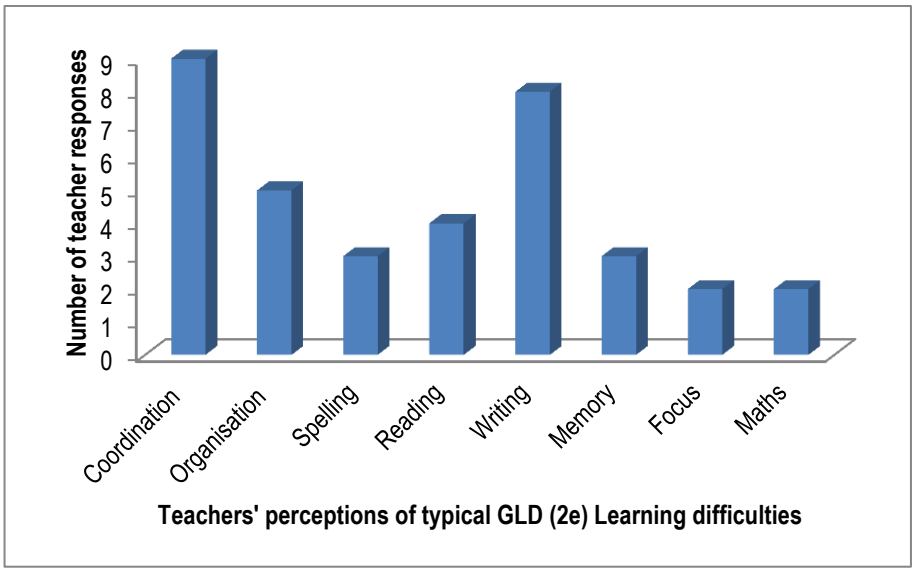

Figure 5.2: TPQ teacher respondents' perceptions of typical GLD (2e) Learning difficulties
Note. Coordination = handwriting coordination, Organisation = self-organisation, and Writing = written expression

3. Work application

For the category of Work application (Figure 5.3 & Appendix 7), teachers note problems primarily with maintaining focus, application and associated incomplete work. In the initial coding in Appendix 7, the theme of Attention difficulties incorporates both focus and application.

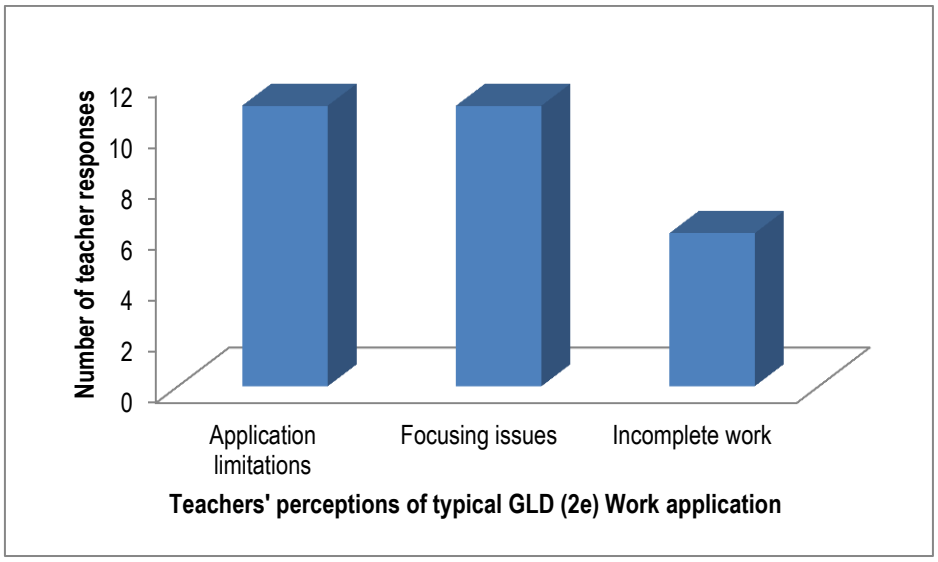

Figure 5.3: TPQ teacher respondents' perceptions of typical GLD (2e) Work application
Note. Application limitations are other issues besides focusing, for example, learned helplessness and avoidance of task

4. Achievement on standardised tests

With Achievement on standardised tests (Figure 5.4), the main finding is inconsistency in achievement results and variation between results, which from Appendix 8 can be influenced by the test type, or from one teacher response, between what is achieved in class as compared to a standardised test.

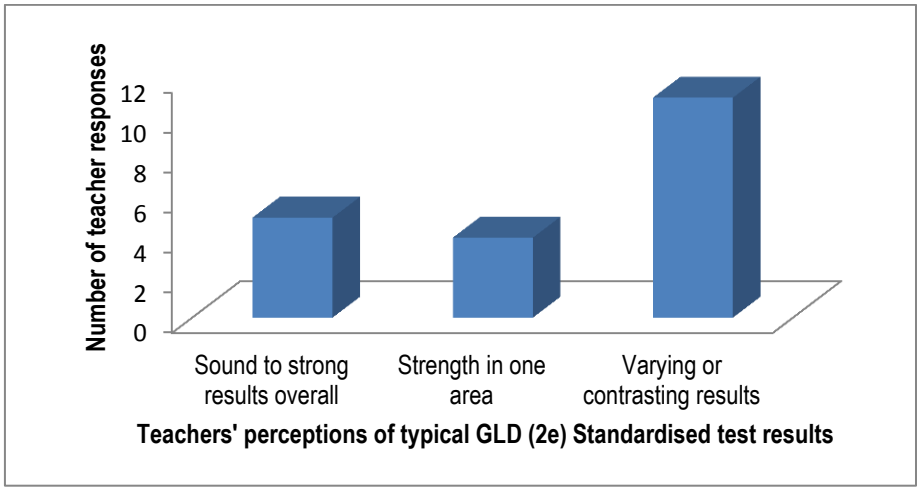

Figure 5.4: TPQ teacher respondents' perceptions of typical GLD (2e) Standardised test results

5. Talking and listening skills

The main themes observed in this category using NVivo are issues with listening and/or focusing (Figure 5.5) and class discussions either in limited participation or related issues. In the initial coding in Appendix 9, distractibility and listening and attention issues, as well as class discussion issues are observed. It is noted that in NVivo, listening/focusing also incorporates distractibility.

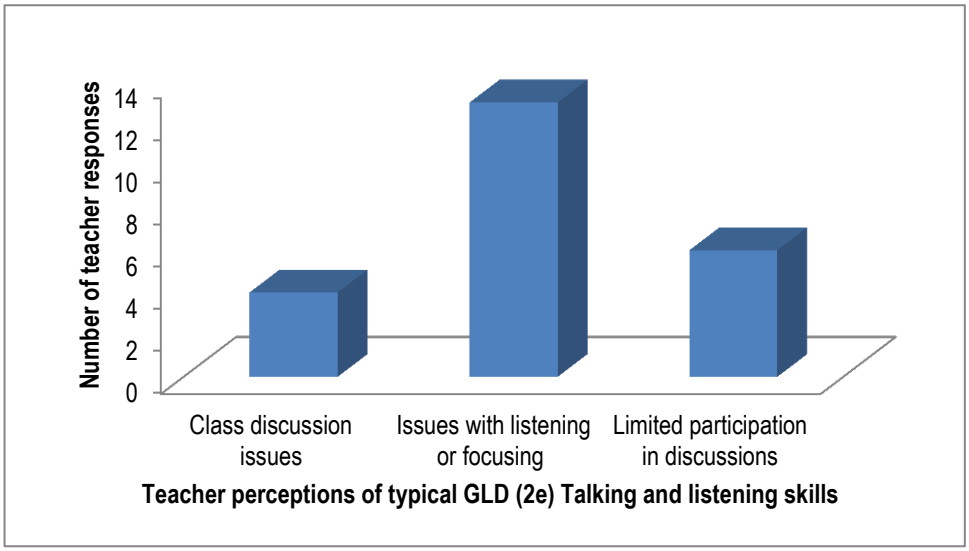

Figure 5.5: TPQ teacher respondents' perceptions of typical GLD (2e) Talking and listening skills

6. Emotional indicators (Table 5.6 & Appendix 10)

Teachers anticipated Emotional indicators would be observable more predominantly in the children's approach to schoolwork and to a lesser extent in social interactions (Appendix 10). In Figure 5.6 these observations are noted as issues with frustration, anxiety and problems with self-esteem and behaviour.

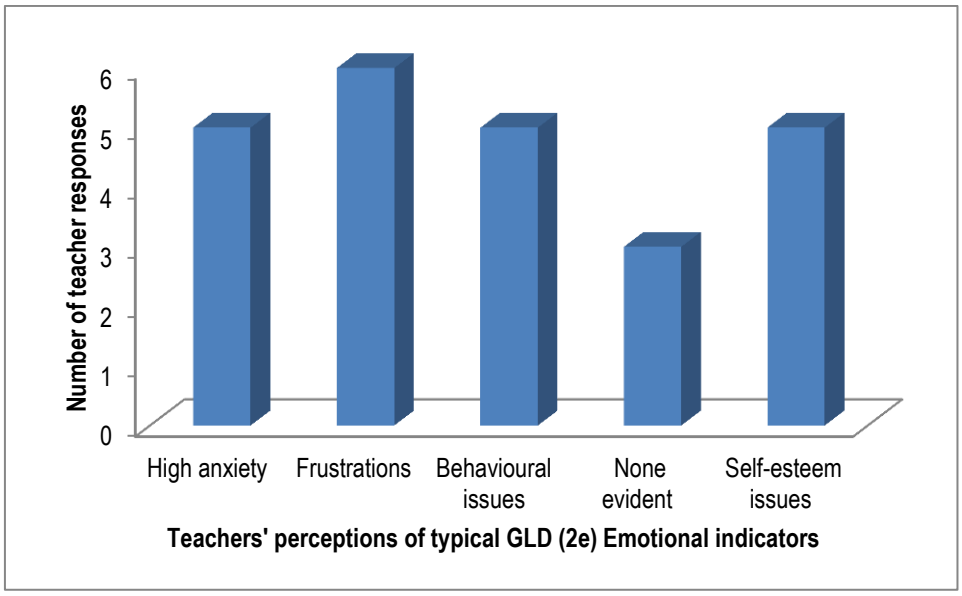

Figure 5.6: TPQ teacher respondents' perceptions of typical GLD (2e) Talking and listening skills

7. Other characteristics (Appendix 11)

Nine of the 11 teachers included extra traits in this optional category, some of which in the initial coding were added or cross-coded to several of the other six tables. For instance, in Appendix 11 it can be seen that the response "Agitation from possible overload on Working memory" was cross coded to the category Emotional indicators under the theme 'Visual signs observable in approach to school work'. These other observations were included in the relevant NVivo themes prior to running Matrix queries. The remaining traits in Appendix 11 that were not moved to other categories are too few in number to warrant review.

It was noted previously that the concept 'learning difficulties' involves problems with learning so there are themes in the categories of Work application, Talking and listening and Emotional indicators that are interconnected. The key theme which is observed in the categories of Learning difficulties, Talking and listening and Work application is issues with focusing.

Generally, for this sample of 11 teachers, twice-exceptional children are anticipated to have strengths as well as learning difficulties in one or more areas. Based on these results, a typical twice-exceptional child seems to have strengths in thinking skills, oral language and a subject area. Figure 5.7 shows the most frequent 100 words in teacher perceptions about traits in the Strengths Category (for example, thinking skills, vocabulary, verbal, and knowledge) that are linked to the main themes.

Figure 5.7: Word cloud of 100 most frequent words in the Strengths category

Note. The words refer to difficulties, and their frequency is reflected by word size (Edhlund & McDougall, 2016) and being in bold.

The main learning difficulties are likely to be connected to the areas of writing, both in handwriting coordination and expressing ideas, as well as in a subject area. There are also noted expectations of focusing and application difficulties, inconsistent results in standardised tests and socio-emotional needs. Figure 5.8 indicates the most frequent 100 words in teacher perceptions about traits in learning difficulties (including related themes in other categories) with the most frequent words ‘work’, ‘tasks’, ‘instructions’ being related to application, focus, work application and a subject area.

Figure 5.8: Word cloud of the 100 most frequent words found in Learning difficulties (including related themes in Work application, Emotional indicators and Talking and listening)

Note. The words refer to difficulties, and their frequency is reflected by word size (Edhlund & McDougall, 2016) and being in bold.

5.1.1. Is there a correlation between teacher training, experience and identification of possible twice-exceptionality evident in the initial coding?

From the TPQ there is a correlation between knowledge about twice-exceptional children and professional development, and also years of teaching experience. No conclusive interpretation can be made about the influence of pre-service training because less than half of the cohort could recall pre-service training in giftedness or LD (Table 5.1) and the three groups (according to years of teaching) were of uneven size.

Table 5.1: Teachers' exposure to pre-service training and professional development in giftedness and/or LD

ID numbers	Group	Years of teaching	Total out of 11 teachers	Pre-service in G	Pre-service in LD	Professional development in G	Professional development in LD
1,2,3	1	≤ 4	3	2	3	1	1
4,10	2	5 to 10	2	1*	1	2	2
5,6,7,8,9,11	3	≥ 11	6	1	Nil	6	4
Total out of 11			11	4	4	9	7

Note. Abbreviations: ID numbers = identification number of teachers; G = giftedness; LD = learning difficulties; * = teacher with further tertiary training in gifted education

The results in Appendix 5 (Strengths) indicate that teachers with 11 or more years of teaching experience, who also had more exposure to professional development particularly in giftedness, were more likely to include more encompassing attributes about the strengths of GLD (2e) children. For instance, Teacher ID: 9 who has completed tertiary studies in gifted education, specifies that a twice-exceptional child may reveal lateral thinking skills, have advanced vocabulary and a high level of knowledge. Teacher ID: 2 who has received no professional development in either giftedness or learning difficulties, only indicates strengths in a specific subject area.

In considering Learning difficulties (Appendix 6) and Emotional indicators (Appendix 10), it is noted that these categories are usually more visible to teachers and consequently the results indicate that there was little difference in what was detected across their range of experience and training. There are instances where there are more specific details provided by the more experienced teachers in the category of Learning difficulties pertaining to subject area, for example ID: 9, 10 and 11 in Appendix 6. For Emotional indicators (Appendix 10) detailed observations are evident from ten of the eleven teachers.

5.1.2. Optional open-ended responses from the Teacher Perceptions questionnaire

On the last page of the TPQ, there is an optional section that invited any further perceptions that teacher participants might like to include. Under this section I included "for example, your view about the suitability of the term gifted" to ascertain possible feelings about the use of the word 'gifted'. Of the seven teachers who recorded their perceptions, four expressed limited acceptance of the use of the term. While teachers accepted the existence of children with high ability, there was reservation about the use of the word 'gifted' and its implications. Teachers' responses are included in Table 5.2 and reservations about the term are highlighted in yellow. Two teachers in the Staff meeting presentation also indicated that rather than focusing on giftedness per se, it was important to acknowledge that all children had gifts. These teachers had ≤ 4 years of teaching experience, one reported pre-service training and neither had exposure to professional development in gifted education. Two other teachers in the TPQ indicated problems that lack of identification of GLD (2e) can cause. Teacher ID: 10 felt that difficult behaviour often excluded GLD (2e) children from being part of a gifted group, whilst Teacher ID: 11 expressed her view that an education system focused on a standardised approach was the gifted child's "worst nightmare". To summarise, teachers are aware of the existence of children with high potential and learning difficulties, but there are issues with the appropriateness of the term 'gifted'. There is recognition of the complexities in identification and the need for appropriate intervention

Table 5.2: Teacher participants' open responses from the Teacher questionnaire

ID	Years of teaching experience	T g	L/Dif	Training and experience	Optional open response
1	≤4 yrs	Pd Ps	Pd Ps	More training and experience with LD than 'g'	I also see how the term gifted is quite open-ended and may not give a clear understanding of the child's strengths unless specifically identified. The term gifted brings to mind strength, natural aptitude, exceptional, talented, gift. I am intrigued that GLD children can be so different and yet similar….
2	≤4 yrs	N	Ps		I feel the term 'gifted' may bring forth some issues of anxiety and pressure from family
3	≤4 yrs	Ps	Ps	Training was one semester in LD with optional 4th year specialising in LD	I prefer avoiding the use of the term 'gifted' as it seems to have an inextricable connection to certain connotations. 'Higher order thinker/high achiever' are names which describe their capabilities. Every child is gifted in life.
4	5-10 yrs	Pd Ps	Pd Ps		I have had one child who had low muscle tone and ASD. This manifested itself differently to my above description.
5	≥11 yrs	Pd Ps Tc	Pd Ps		I do like the terms GLD as compared to 'twice exceptional'. I really believe that there are more of these students that come under the 'GLD' than we realise. Often they present with ADHD, sensory integration issues, emotional behavioural issues.
6	≥11 yrs	Pd	Pd		Unless formally assessed as 'gifted' can only assume they have a 'potential' or 'high potential'.
7	≥11 yrs	Pd	N		Some home/family issues can impact on students
8	≥11 yrs	Pd	Pd		I find the term 'gifted' can be used very loosely by parents and teachers. A good all round student can be placed under this heading; however when looking at the true classification of the word, someone who is showing or able to work at an extreme level from his/her peers.
9	≥11 yrs	Pd	Tc		I don't have a problem with the term 'gifted'. I think a change of term will quickly adopt the same conclusions in people's minds. I consider a person gifted in a particular area when I notice and or measure an ability that stands out noticeably from the cohort of that particular year group at the time. BUT also from my own recall of previous year groups.

ID	Years of teaching experience	T g	L/Dif	Training and experience	Optional open response
10	5 to10 yrs	Pd	Pd	Supported the two groups by differentiation or by referring to learning support staff or G & T groups	The G&T group is often associated with producing young Einsteins – students who are focused, self-motivated and intelligent. The students who have LD don't qualify to join the group unless the teacher can substantiate their moments of brilliance and provide opportunities to bring the skill/unique talent to the forefront, while at the same time overcoming their other difficulties. Often there are behaviours that get in the way of learning and, the lack of self-regulation and focus, excludes them from the G & T group.
11	≥11 yrs	Pd	Pd	Taught mainly in junior school including composite classes	I believe that a gifted child can be recognised at a very early age – even from birth. Often older family members will express this as a 'spark'. I have always felt that the Montessori methods for pre-school children allowed individuals to show 'giftedness' or 'talent' when very young and exposed to a wide variety of learning situations and stimuli and with observant educators can be assessed quite early. Their direction thereafter is vital. Our standardised education system can be a gifted child's worst nightmare. My feeling is that a gift is a specific area – a natural born thing to be nurtured but talent is wide ranging with amazing scope and possibility for adaptation, integration and the sky's the limit for imagination and invention often into the fantastic.

Note. ID = identification number; T g = training in gifted education; L/Dif = Learning difficulties; Pd = professional development; Ps = pre-service training; Tc = tertiary course; N = none; highlighted text refers to teacher reservations about the term giftedness

5.1.3. TPQ: Discussion

As indicated, the purpose of the TPQ, besides introducing the nature of the Study to the Staff of the School site, was to ascertain and then compare traits that the teacher respondents had identified as being possibly characteristic of GLD (2e) with those selected from literature sources in the later development of the TCQ. Table 5.3 illustrates the Literature review conclusions, Study findings and MMR method of data collection and analyses. The following section discusses the findings of the data obtained from the 11 teacher participants who completed the TPQ (henceforth referred to as the teachers). It cannot be assumed that the sample is representative of the population, but the data still have relevance to the unfolding of the Study.

5.1.3.1. What is there to be gleaned from the TPQ findings?

The two key insights relevant to the inclusion of the TPQ in the Teacher Checklist Questionnaire Development (TCQD) sub-phase, are that the teachers are aware that high ability/giftedness can coexist with learning difficulties, and generally were able to predict typical traits of GLD (2e). The first insight is parallel to Literature Review Conclusion 1(LRC 1) in Table 5.3 where teachers in the cited study were aware that giftedness or high ability can coexist with LD (Wormald, 2009, 2011b). However, this cognisance may not necessarily equate to knowledge of the nature and diversity of twice-exceptional traits, which is seen as a common limitation amongst teachers (Crim et al., 2008; Wormald, 2009). Whilst the two key Study findings are positive in terms of the identification of 2e there were several factors, at the time, that are likely to have influenced teacher perceptions. One factor was related to concerns and discussion in the School, initiated by the Catholic Schools Office, that there may be very able children in schools who could be underachieving and 'slipping through the system'. Another possible contributing factor was first-hand teacher experience, because in the school were several children with both marked LD and very high ability, who were known by the teachers and provided a clear example of the complex patterns and challenges of giftedness/high ability coexisting with learning difficulties. A further influence on the results of the TPQ was that prior to the Study, teachers were aware through a Staff memo that I was conducting research in the field of GLD (2e), so when it came to completing the questionnaire the term was known and possibly reflected upon. This prior information was then reinforced by the title of the questionnaire, Perceptions about children who may be gifted with a learning difficulty

(GLD), and also the inclusion of a vignette of a possible GLD child. It could be argued that the structure of the TPQ, which provided seven sections for response, each headed with a typical focal area/category relevant to GLD (2e), may have prompted the range of traits proffered by the teachers. However, the format of the TPQ encouraged reflection about what traits may be evident in these areas, which I felt was useful as a starting point for teacher professional development about GLD (2e) and for laying the foundation to compare the data to the literature in the development of the Teacher Checklist Questionnaire.

Table 5.3: TCQD Sub-phase: Teacher Perceptions Questionnaire – Literature review conclusions and Study findings

Phase One Question: What are the components of a comprehensive, useful checklist for the preliminary stage of identifying possible gifted children with learning difficulties?	
Methodology: MMR **Methods**: PAR design A: Data collection – Qualitative open-ended questionnaire A: Data analyses – Content analysis B: Data collection – Qualitative informal interview B: Data analyses – Content analysis	
Literature review	**Study** A: Teacher Perceptions Questionnaire B: Staff Meeting presentation
Conclusions (Section 2.3.5) Teachers:- 1) are aware of GLD (2e) (Wormald, 2009, 2011); 2) lack knowledge of the diverse nature and issues related to GLD (2e) (Crim et al., 2008; Wormald, 2009) ; 3) acknowledge problems with i) accessing information and resources in schools, ii) specific teacher training, and iii) the restrictions of an already overfull curriculum (Wormald, 2009); 4) can have negative attitudes about giftedness (Geake & Gross, 2008); 5) may not recommend GLD (2e) children for enrichment programs due to negative attitudes about learning difficulties (Bianco & Leech, 2010); and 6) feel identification is dependent on specialist opinion (Wormald, 2009).	**Findings** Teachers:- 1) are aware of the existence of children with high potential and learning difficulties; 2) show a correlation in their perceptions between knowledge about GLD (2e) children and professional development, and also years of teaching experience; 3) recognise issues with the appropriateness of the term 'gifted'; 4) acknowledge complexities in identification and the need for appropriate intervention; 5) note main strengths in thinking and oral language skills; and 6) believe the main learning difficulties are in handwriting/coordination, self-organisation, attention/focus, inconsistency/variation in achievement results, application and emotional issues.

Note. Adapted from Cornish (2012)

In relation to teachers' responses in the TPQ, one key observation is that their perceptions were generally influenced by years of teaching and professional development, particularly

in relation to proffering traits in the category of Strengths. From Table 5.3 it can be seen from LRC 3, that there is evidence of concerns amongst teachers about lack of both appropriate training in GLD (2e) and access to information (Wormald, 2009). Even though the TPQ did not seek teacher views about training and resource accessibility, it was still evident in the findings that there was a correlation, particularly between teacher responses in the Strengths focal area, and teaching experience and professional development. Compared to teachers who indicated less than five years of teaching experience and had little or no training in either giftedness or learning difficulties, others who were both more experienced and qualified tended to cover a greater range of possible traits. This observation may have been a chance result but the trend is still evident. Interestingly, there was no correlation between teacher credentials and traits identified in the Learning difficulties section of the TPQ, which may reflect the tendency for learning difficulties to be more observable, depending on their severity. This finding is a reminder of how the more visible and at times confronting traits of LD can mask true ability (Assouline et al., 2010; Davis & Rimm, 2004; Ruban & Reis, 2005). It is also noted, however, that whilst teacher perceptions of the different types of learning difficulties may reflect what is considered more likely or observable, it is possible that the areas of fewer perceived difficulties may have traits that are less obvious. Whilst the observations centred on teacher training/experience may not seem pivotal to the Phase One question (Table 5.3), they support the importance of specific and effective teacher education, including professional development in identifying and supporting the needs of GLD (2e).

Another relevant point is that the predominant collated traits from the TPQ Strengths category are relevant to the Intellectual and Creative categories identified in Gagné's DMGT 2.0 (2008 update) and his EMTD (2013) (Gagné, 2010, 2013). As noted in Figure 5.1, teachers mainly focused on strengths in thinking skills, oral language and a subject area. Whilst two teachers noted leadership in the strength area (Gagné's Social Domain) (Appendix 5) there is no reference to traits from the DMGT 2.0's Perceptual, and Physical categories. This finding is likely to be a result of the high priority given in schools to academic development and/or possibly indicate some unfamiliarity with giftedness in domains outside of the Intellectual and Creative.

Teacher responses in the optional section of the TPQ indicated that on the whole they were reflecting on the question of GLD (2e), which was important to the school site, and to the Study and a key advantage of the developmental spiralling phases of a PAR design.

Four of the 11 teachers expressed reservations about the term ‘giftedness’, which may possibly equate with LRC 4 in Table 5.3 that teacher attitudes about giftedness can be negative (Geake & Gross, 2008); however, apropos of the TPQ findings, teacher concern was more about the suitability of the term ‘giftedness’, which may or may not reflect an implied reservation about the concept. It will be noted that I qualify LRC 4 with ‘can’ have negative attitudes, because this finding may vary across the teacher profession according to educational context and teacher experience and training. An instance of this variation was found by Lewis and Milton (2005), where the sample of Montessori teachers had a positive attitude both before and after professional development.

5.2. TCQD (B): Staff meeting presentation

The Staff meeting was mainly for the purpose of outlining the study, reviewing possible traits of GLD (2e) and determining whether teachers may have children in their classes who may not be operating at their full potential and possibly have hidden abilities.

5.2.1. Staff meeting presentation – Results

The teachers nominated eight possible hidden GLD (2e) children, two of whom later became participants/subjects in the study. In the Staff meeting, two teachers expressed the view that all children had gifts. One of the teachers also recorded her same view in the TPQ (see Table 5.2).

5.2.2. Staff meeting presentation – Discussion

Although the Staff meeting presentation yielded the names of a number of possible GLD (2e) children, I was also aware that there could have been other eligible children who may not have been detected by the teachers. It would be hoped that if any were unidentified, and is still the case, that in due course an appropriate assessment may assist in the initial stage of their identification. The view of two of the teachers about the universality of gifts amongst all children was not surprising considering that the school, as part of its religious ethos, actively promotes building the innate potential of each child. There is insufficient evidence to infer that these teachers did not fully understand the construct of giftedness. I feel that their perception is related to Findings 3 and 4 (Table 5.3) regarding the complexities of terminology and implications for identification.

5.3. TCQD (C): Development of a comprehensive Checklist

The development of the TCQ (Appendix 2) was the ultimate section of the Development sub-phase directly related to the question: *What are the components of a comprehensive, useful checklist for the preliminary stage of identifying possible gifted/high-ability children with learning difficulties?* The following section outlines the outcome of the TCQD.

5.3.1. Outcome of the comprehensive focus

To address the question of comprehensiveness, I first selected the six categories for Section A of the Checklist (Indicators of possible learning potential) from a widely recognised model of giftedness throughout Australia and internationally: Gagné's Differentiated Model of Giftedness and Talent (DMGT), also known as DMGT 2.0 (Gagné, 2008). In the first column of the model, which is titled Natural abilities, the categories referred to as domains by Gagné, are grouped under two main abilities:

1. Mental abilities (consisting of Intellectual, Creative, Social and Perceptual); and
2. Physical abilities (Muscular and Motor control).

It will be recalled that Gagné further reviewed his DMGT and developed the Expanded Model of Talent Development (EMTD) in 2013 (Gagné, 2013; Wellisch, 2016). The six domains in both models are identical; however, the earlier model is still currently accepted in Australia. The particular relevance of the EMTD in considering GLD (2e) children was reviewed in Chapter 2: Literature Review.

Section B of the Checklist (Indicators of possible learning difficulties), comprises three categories of learning difficulties:

1. Academic;
2. Socio-emotional; and
3. Other behaviours.

These categories are familiar to teachers in schools and the teacher focus-group felt that they best encompassed observable traits that may coexist with giftedness or high ability.

The list of items selected for assessment purposes in each of the categories in both Sections A and B were mainly derived from research-based and anecdotal lists taken from various literature sources. The findings from the TPQ were all found to be covered by the traits selected from the literature. It is important to note that there are authors whose perceptions would encompass more than one of the included traits, but I selected items that were more specific. For instance, as well as the trait regarding long- and short-term memory issues, several related traits were included that may be more readily observable in the classroom, for example, remembering and following information, and remembering abstract information. Overall there are 88 assessable items in the TCQ. To show some of the literature sources of all items for the TCQ some are shown in Table 5.4 and the complete list is in Appendix 16. The teacher- focus group affirmed a number of the items based on their experience. Mirroring the range of literature-based characteristics, there are a greater number of items in the Section A: Intellectual category (14) and all categories of learning difficulties in Section B: Academic (26), Socio-emotional (14) and Other behaviours (15). In contrast to these totals there are five items in the Creative category, six in the Perceptual and three in the Social. The Muscular and Motor Control categories have few items, two and three respectively.

5.3.2. Development of a comprehensive Checklist – Discussion

The following section reviews the teacher focus-group decisions on the structure and content of the TCQ based on the Literature findings, the TPQ, and their experience with possible twice-exceptional children. Table 5.4 includes a summary of the key Literature review conclusions, the methods and teacher agreements.

Table 5.4: Sub-phase TCQD: Development of the TCQ – Literature review conclusions and Teacher decisions

Phase One Question: What are the components of a **comprehensive**, useful checklist for the preliminary stage of identifying possible gifted children with learning difficulties?	
Methodology: Mixed Methods Research); **Research design**: Participatory Action Research **Methods**: C: Data collection – Review of literature; TPQ; Informal interviews with teacher focus-group C: Data analyses – TPQ content analysis; teacher focus-group transcriptions for member checking	
Literature review	**Study C**: Development of a **comprehensive**, useful checklist questionnaire
Conclusions (Section 2.2.3) 1) Typical traits of giftedness in 2e children include academic strengths in abstract thinking, high ability, in-depth knowledge, use of vocabulary, components of metacognition, and strengths in the categories of creativity (Nielsen, 2002), social interactions, perceptual abilities and physical prowess (Gagné, 2008, 2010)_ . 2) Typical traits of learning difficulties in 2e children can include: - academic difficulties such as discrepancy between verbal and written skills, handwriting coordination issues, problem with task completion (Montgomery, 2009), inconsistent results, concentration, distractibility and memory (Nielsen, 2002); and - intrapersonal and interpersonal issues (Nielsen, 2002; Neihart & Betts, 2010). 3) Internationally and Australia-wide there is acceptance of Gagné's DMGT 2.0, including the six natural abilities' domains (ACARA, n.d.-b).	**Findings from TPQ** include: 1) main strengths in thinking skills, oral language skills a specific subject or area, and creativity; and 2) main LD in handwriting/coordination, a subject or specific area, writing, level of attention, inconsistency/variation in results, distractibility and emotional issues. **Teacher focus-group decisions** to include the following in the Checklist: - Gagné's six DMGT 2.0/EMTD categories of natural abilities; - LD under Academic difficulties, Socio-emotional and Other Behaviours (not under Disability sections); - traits noted from Literature Review but with 'appropriate' wording, examples, and multiple traits connected to a main LR trait; - optional response section for each category; and - an assessment grid for teacher rankings.

Note. Adapted from Cornish (2012)

5.3.2.1. Content and structure of the Checklist

The teacher focus-group agreed that the six aptitude categories in Gagné's DMGT 2.0 (update, 2008 and EMTD, 2013) would generally best suit the Strengths section of the TCQ based on education policy recommendations. The Model, besides having widespread and national acceptance, was considered relevant as a framework for identification purposes in the primary school, because it captured a range of areas where children can excel. There are multiple references to typical academic and creative traits in gifted/high-ability children in the literature and, 'on the surface' to a lesser extent, twice-exceptional children. It is noted from the literature that gifted traits associated with 2e are not as comprehensive as the listings for gifted children with little or no evidence of LD. This observation may be a result of the greater visibility of some LD and/or difficulties in detection of giftedness. It could be questioned whether the inclusion of the other DMGT 2.0 categories of Social, Perceptual and Physical, which do not feature prominently in the

literature, are worthwhile in a questionnaire, particularly in the educational context where the focus is more academically and creatively orientated and where available assessable traits are fewer in comparison. However, in considering the six identified domains of giftedness in Gagné's DMGT 2.0 (2013), the teacher focus-group agreed that the remaining four (Perceptual, Social, and the physical domains of Muscular and Motor control) be included to flag the existence of exceptionalities in multiple areas of human endeavour.

A feature of the traits selected for the TCQ, as noted briefly in Section 5.3.1, is the inclusion of multiple items connected to several key traits found in the literature. The purpose was to provide teachers with more observable instances where the central item may be identified. For instance, the traits of abstract thinking and problem solving were also underlying items such as advanced reasoning skills in response to difficult questions, and asking in-depth questions. The problem can arise with this feature that similar items in a measurement scale can lead to multicollinearity, which is an inflated score of internal consistency (Field, 2013; Pallant, 2013). The analyses in Chapter 6 include consideration of this possibility and whether the TCQ would benefit from streamlining prior to a future trial.

The learning difficulty traits, which in the Literature review were grouped under academic, interpersonal and intrapersonal difficulties for reference purposes, appear in the TCQ under the categories Academic, Socio-emotional and Other behaviours. The teacher focus-group agreed that these categories were meaningful and relevant to teachers within the context of the primary school. They preferred these categories for a preliminary assessment tool rather than using specific categories associated with Learning disorders/disabilities, such as SLD and EBD as observed in a screener used for already diagnosed twice-exceptional children (Rogers, 2012). The number of items in the TCQ categories of learning difficulties is extensive, but the teacher focus-group felt that these items reflected the key difficulties identified in the literature. The question of possible multicollinearity, noted above, is also reviewed for the categories of learning difficulties in Chapter 6.

Another positive feature of the TCQ connected to teacher usage, is the choice of wording for the items. The teacher focus-group felt that it was more appropriate to use a style of wording that does not suggest definiteness, nor invite a premature label. For instance,

rather than a trait stating ‘poor concentration’, the wording is “Experiences challenges with concentration”. Similarly, the qualifying verb ‘can’ appears in a number of the items, for example, “can be easily distracted”. The choice of descriptors (Not Applicable to Always) may counter concerns of premature labelling but to allow for reservations amongst teachers, the style of wording was considered a priority, even though in instances the items are wordier than what appears in other lists such as Bees (2009) and Potential Plus UK (2014). A further point regarding the wording of the items was the teacher focus-group’s attention to ensuring optimal face validity. In a number of items, examples were added to enhance clarity, for example “Shows uneven skills, e.g., varying results in class”.

In Chapter 4 it was noted that the three teacher focus-group members conducted a preliminary test of the clarity of the TCQ items. They agreed that all items were suitable and that the examples were a useful addition to the TCQ. The three teachers concluded that the TCQ was ready for teacher trialling at the school site.

Teacher insights from the Teacher Perceptions Questionnaire were also reviewed in the TCQD, but of the key findings noted in Table 5.4, two were also found in the Literature review conclusions. Although there were no additional items to be included from the TPQ, this questionnaire, together with the Staff Meeting presentation, was a vital component of mainly the reconnaissance phase of the PAR design to enhance awareness and consideration of the challenges of GLD (2e). It complemented the school’s focus on high-ability students who were underachieving, thereby providing a further opportunity for staff professional development. It also meant that all future interactions with the teacher participants, whether in consultation regarding child subjects or as members of the teacher focus-group, prepared everyone for the further stages of the Study and, equally importantly, increased awareness of the need to identify possible twice-exceptional children and then review appropriate specialist and educational intervention.

The Optional responses component of the TCQ was considered to be essential for acquiring a more thorough understanding of the strengths and learning difficulties of child subjects. The inclusion of closed-ended and open-ended responses is one example highlighting the value of a triangulated approach typical of MMR. With the possibility that the TCQ, after future trialling, may become an important tool for teachers to use as a reference, the ‘optional responses’ sections are an important feature.

5.3.2.2. Other supportive features of the Teacher Checklist Questionnaire

There are further attributes which add to the relevance of the TCQ for teachers. The assessment grid (see Appendix 2, pp 5–11) provides an essential component for teachers mainly for comparison purposes. The 6-point grid with its descriptor headings allows for ease of scoring the categories and is useful as a guide for teachers comparing a child's item scores in an area of particular focus. For example, in the key area of writing difficulties which is noted as a typical characteristic (Montgomery 2009, 2015) of some 2e students, there are five related items which can all be highlighted and results compared. Another strength of the TCQ is the explanatory page of background information including broader terms for giftedness and reference to learning difficulties, that is, "significant learning potential or gifted potential and simultaneously have one or more learning difficulties". A further possibility of the TCQ is its potential use as a general screener for assessing multiple abilities and/or learning difficulties in a class of children and not specifically to an initial investigation into 2e.

5.3.2.3. Are there any issues with the structure of the TCQ?

The main issue with the TCQ centres on the question *What is to be done with the results?* In Appendix 27 there is a proposed (untrialled) master sheet for teachers/support staff to transfer results as a concise summary. This proposal is addressed in the recommendations section in Chapter 10.

5.4. Summary of Chapter 5

The focus of the chapter was reviewing and discussing the results/outcome of the three components of the Teacher Checklist Questionnaire Development of Phase One. The TPQ (A) and Staff meeting presentation (B) provided a sound foundation for the Study, particularly in accessing data re teacher views both from an open questionnaire and informal interviews. Teachers predicted key strengths and areas of learning difficulties under the seven provided focal areas/categories typical of 2e. Viewpoints from the TPQ were reviewed and traits noted were encompassed by literature findings. There were some teacher concerns about the use of the term 'gifted'. In terms of reservation about terminology, alternative wording is provided in the instructions page of the TCQ.

The third component of the TCQD sub-phase was the compiling/development of the TCQ (C) by three teachers with an interest and some experience with GLD (2e). The outcome is the TCQ with two major sections, one including categories and items related to Strengths and the other to learning difficulties. The Strengths categories are based upon Gagné's DMGT/EMTD (six natural aptitude domains) and learning difficulties under three categories (Academic, Socio-emotional and Other behaviours) that the teacher focus-group felt best encompassed the range of traits from the literature, and from their experiences were considered relevant for teacher referral. The items selected for all categories are a combination of evidence-based and anecdotal, together with the teachers' prior experiences in modification of wording and inclusion of examples for some of the items to enhance face validity.

To conclude, the TCQD focused on the TCQ's comprehensiveness, as the necessary prerequisite for the trial of its usefulness. The Study found that the components of a comprehensive checklist incorporate categories of giftedness based on a widely accepted gifted model and also categories of learning difficulties relevant for use by primary school teachers. Where available, items for these categories are research-based, but also include anecdotal traits, particularly where affirmed by multiple authors. Subject to further trialling, the TCQ's inclusion of appropriately worded items, a manageable assessment grid and optional response sections represent a comprehensive tool for use by primary school teachers. Limitations of the TCQ are reviewed in the Conclusion chapter. Through the methodology of Mixed Methods Research and a PAR design, the foundation was established for the Trial of the TCQ. Chapter 6 explores the results and discusses their relevance.

Chapter 6. Phase One: The Teacher Checklist Questionnaire Trial sub phase — Results and Discussion

> Where is the book in which the teacher can read about what teaching is? The children themselves are this book. We should not learn to teach out of any book other than the one lying open before us and consisting of the children themselves. (Rudolf Steiner, cited in Barnes, 1974/75)

To determine the usefulness of the TCQ, several statistical techniques were used to measure the data arising from the Trial process (listed as (D) in the list of mixed methods for Phase One, Figure 4.1). Teachers assessed selected child subjects from their classes and ranked them on all items using a 6-point Likert scale (TCQ). Owing to the fact that the data were obtained from the first trialling of the TCQ, the analyses, noted as (E) in Figure 4.1, were a preliminary investigation into its validity and reliability, thereby determining usefulness as an assessment tool. The criterion of usefulness is pivotal in this chapter to the Phase One question: *What are the components of a comprehensive, **useful** checklist for the preliminary stage of identifying possible gifted/high-ability children with learning difficulties?* The other aspect of usefulness is related to the TCQ's practical application for teachers. Findings will endeavour to throw light on these vital considerations.

6.1. Preliminary analyses (Demographics and TCQ structure) and Discussion

The following section explores the demographics for both teacher participants and child subjects/units of observation, descriptive statistics related to mean rankings for each child, and findings for the internal consistency and correlations of the TCQ categories. These results provide a platform or reference for future replication.

6.1.1. Teacher participants – demographics

The demographics of the teacher participants indicate that there are similarities and marked variations. The key similarity is that they are homogeneous in terms of religious and socio-economic background. From Table 6.1, the ratio of female teachers to male is 10:1, which reflects the teacher population of the School site. These figures are similar to

overall trends in primary schools where in 2015 and over the past ten years, "eight out of every ten teachers are female" (Weldon, March, 2015). In terms of years of teaching experience, 60% of all respondents at the school site had taught for longer than 10 years. Only one teacher had completed extra tertiary training in gifted education and 50% reported some exposure to pre-service training in gifted education compared to 30% in learning difficulties. Most teachers have some form of professional development in both areas.

Table 6.1: Demographics of teacher participants trialling the TCQ

Teacher participant's ID number, and gender		Years of teaching	Status (FT) or (PT)	Year level taught during trialling	Pre-service training: gifted education	Professional development: gifted education	Pre-service training: learning difficulties	Professional development: learning difficulties
1	F	≤ 4	FT	2	No	Yes	No	Yes
2	F	≤ 4	FT	2	Yes	Yes	No	Yes
3	F	≤ 4	FT	3	No	Yes	No	No
4	F	5–10	PT	3	Yes	Yes	Yes	Yes
5	F	≥ 11	PT	3	Yes	Yes	No	Yes
6	M	≥ 11	FT	4	No	Yes	No	No
7	F	≥ 11	FT	4	No	Yes	No	Yes
8	F	≥ 11	FT	5	Yes	Yes	Yes	No
9	F	≥ 11	FT	6	No	Yes	No	Yes
10	F	5–10	FT	6	Yes	Yes	Yes	Yes

Note. Abbreviations: F= female and M = male; FT = full time and PT = part time; Highlighted 'Yes' = ID: 4 who has also completed a tertiary course in gifted education

6.1.2. Child subjects – demographics

Relevant demographic details of the child subjects, then their individual and mean rankings/median scores (now referred to as mean rankings), obtained from the Trial are shown in Table 6.2. Of the 24 children, there are 22 who were born in Australia and speak fluent English. One child is Korean and the other, who has been in Australia for three years, is of Spanish origin. Both speak English and are bilingual. Specific geographic location of the School site is not indicated, but for the later purposes of discussion and recommendations for future study, it is noted that the population of the school is drawn from medium to high socio-economic backgrounds. The description of the relevant details for the children indicate that they were from three stages or levels of primary/elementary school years — late Stage One to Stage Three. Note from Chapter 3 that there are three

stages in New South Wales primary schools. Of the five child subjects in Year 2 (late Stage 1), 60% are female as compared to 40% male, which is identical to Year 6 (Stage 3), but for subjects from the remaining year levels, boys outnumber girls considerably – Years 3 (Stage 2) and 5 (Stage 3), 75%, and Year 4 (Stage 2) 83%.

6.1.3. Mean results of the Trial

The mean rankings of the TCQ categories are predictably varied with more conservative scores appearing in Section B of the Checklist and generally higher rankings in the six categories of Section A (Table 6.2). Four child subjects, ID: 5 (Group 2); ID: 9(b) (Group 3) and ID: 21 and ID: 24 (Group 3) have been scored close to or higher than the ranking Often in the Intellectual category (≥ 5.00), but with at least one Section B category that is close to the Sometimes (≥ 4.00) or Often range. One child, ID: 17 (Group 3) has Always (6.00) in the Muscular category but his overall Intellectual ranking is scored between Not observed (≥ 2.0) and Uncertain (≥ 3.00). There are also instances where results for the Section A and B categories are similar, for example, for ID: 21 and ID: 22 (Group 3). The individual mean rankings for the 24 child subjects provided the basis for further analyses. It is noted that there were 26 teacher evaluations due to two job-share teachers assessing two child subjects in one of the Year 3 classes.

Table 6.2: Description of child participants and Teacher Checklist Questionnaire mean scores

Child participants	Age	Female (F) Male (M)	Year level	Stage	Trialling group	Section A categories						Section B categories		
						Intellectual	Creative	Social	Perceptual	Muscular	Motor control	Academic difficulties	Socio-emotional	Other behaviours
ID:1 Alana	8 y 1 m	F	2	1	1	4.79	4.80	5.33	2.83	2.50	2.67	2.00	2.64	2.00
ID:2 Lily	8 y 4 m	F	2	1	2	4.29	4.40	4.00	3.50	4.00	3.33	2.00	3.79	2.53
ID:3 Alex	8 y 5 m	M	2	1	3	3.71	2.40	3.67	2.17	4.00	2.67	2.42	2.00	2.13
ID:4 Jess	8 y 1 m	F	2	1	2	6.00	5.60	4.67	4.33	4.00	5.00	2.00	2.43	2.40
ID:5 Luke	8 y 4 m	M	2	1	2	5.57	4.60	5.00	4.33	5.00	5.33	2.00	4.36	3.20
ID:6 Lachlan	8 y 8 m	M	3	2	1	3.71	3.40	5.00	2.67	4.50	3.67	1.81	1.00	1.20
ID:7 Harriet	9 y 6 m	F	3	2	3	3.43	2.60	5.00	2.33	4.00	3.67	1.85	1.00	1.00
ID:8a Nathan	9 y 0 m	M	3	2	1	5.29	4.00	4.67	2.67	2.00	3.67	1.12	1.00	1.00
ID:8b Nathan	9 y 0 m	M	3	2	1	6.00	6.00	5.67	3.83	5.00	5.00	2.00	2.00	2.13
ID:9a Dominic	9 y 5 m	M	3	2	3	4.07	4.00	2.67	2.00	3.00	4.67	2.62	2.29	2.00
ID:9b Dominic	9 y 5 m	M	3	2	3	4.93	4.60	3.33	3.33	2.00	5.00	4.62	2.79	3.33
ID:10 Nicole	10 y 0 m	F	4	2	1	4.86	5.40	5.00	2.50	2.00	3.00	1.27	1.00	1.00
ID:11 Jeremy	10 y 1 m	M	4	2	2	5.36	4.40	4.33	2.33	2.50	5.00	1.54	2.14	1.60
ID:12 Ben	9 y 9 m	M	4	2	1	4.43	4.00	5.00	2.67	6.00	4.00	1.08	1.00	1.00
ID:13 Hugh	9 y 7 m	M	4	2	2	4.64	4.00	5.00	3.83	5.00	5.00	2.12	1.21	1.40
ID:14 David	9 y 2 m	M	4	2	1	5.14	4.60	4.33	3.83	5.00	4.67	1.46	1.21	2.00
ID:15 James	10 y 0 m	M	4	2	2	5.07	4.40	4.00	3.83	5.00	4.33	1.69	2.43	1.60
ID:16 Erin	10 y 8 m	F	5	3	2	4.29	3.80	5.33	3.50	2.50	3.33	2.08	2.43	2.20
ID:17 Richard	10 y 8 m	M	5	3	3	2.86	2.40	4.33	2.83	6.00	2.67	3.00	2.29	3.07
ID:18 Scott	10 y 2 m	M	5	3	2	4.29	2.00	2.67	2.83	3.00	2.67	2.65	2.71	2.27
ID:19 Ian	11 y 2 m	M	5	3	3	4.57	3.60	2.67	2.83	2.00	3.00	2.77	2.29	2.67
ID:20 Miriam	12 y 1 m	F	6	3	2	4.79	5.00	4.67	3.17	2.50	3.00	2.27	2.43	2.13
ID:21 Michael	11 y 9 m	M	6	3	3	5.07	3.80	4.00	2.50	2.00	4.00	3.58	3.50	3.33
ID:22 Chris	11y 9 m	M	6	3	3	3.86	4.60	3.67	3.67	2.00	3.67	4.88	4.64	4.20
ID:23 Anne	12 y 3m	F	6	3	1	4.93	5.00	6.00	3.33	2.50	4.00	1.96	2.00	2.13
ID:24 Skye	12 y 1 m	F	6	3	2	5.21	5.40	5.33	2.67	2.00	2.00	2.15	3.71	2.13

Note. Numeral with 'a' indicates the responses of one of the two job-share teachers and 'b' the other; Age in years: abbreviation y = years and m = months

6.1.4. Summary for principal Stakeholders

A summary of the mean results was tabulated for the School Principal, Assistant Principal, teacher participants and a brief summary for parents. Appendix 21 provides a sample summary specifically for the school under the headings of Strengths and Areas that may benefit from on-going support. The table also includes an example of comments.

6.1.5. Measurement of scale reliability of TCQ categories

The internal consistency or scale reliability (Field, 2013) of each of the nine categories or sub-scales was analysed using Cronbach's coefficient alpha (Cronbach's α) to start the process of assessing the TCQ's usefulness (Table 6.3). It will be recalled that for the SPSS tests, I had randomly selected out one of the job-share teachers to satisfy the need for subject independence (Field, 2013) in terms of being ranked by one teacher. Consequently, results obtained reflect all teacher rankings, except job-share Teacher 2.

Table 6.3: Cronbach's coefficient alpha for Teacher Checklist Questionnaire sub-scales

Sub-scale	Cronbach's	Number of items
Section A — Mental Domains/categories		
Intellectual	.92	14
Creative	.88	5
Social	.80	3
Perceptual	.67	6
Section A — Physical Domains/categories		
Muscular	.90	2
Motor control	.61	3
Section B — Learning difficulties		
Academic difficulties	.96	26
Socio-emotional	.96	14
Other behaviours	.92	15

In effect, Cronbach's α indicates the extent that the items gel together or measure the "underlying construct" of each category (Pallant, 2013, p. 101). For example, are the items in the Intellectual category appearing to be relevant to the construct of intellectual ability? Most of the results in Table 6.3 are > .7, ranging from good to strong reliability (Pallant,

2013). The Section A categories of the Intellectual and Creative Domains and all the Section B categories have very strong scores (≥ .88). The internal consistency of the Social and Muscular categories is also strong. The Perceptual category result of .67 and Motor Control, .61 are lower in comparison to the other results.

6.1.6. Inter-item correlations and enhanced efficiency

To endeavour to fine-tune the items used in the categories in terms of improving reliability, or removing any repetitiveness, I reviewed their inter-item correlations. These data are provided with the Cronbach's α output in SPSS. The procedure is not to be confused with a factor analysis, where the relative contribution of each item to the sub-scale construct is examined (Bordens & Abbott, 2011). I was looking to see if there was scope to streamline or to enhance the efficiency of the categories for further study trials.

Noting that very high correlations can indicate multiple items measuring the same characteristic, I reviewed the categories with a score of .90 and above to see if there were any superfluous items that could be removed. Correlations that are unusually high are known in statistics as multicollinearity (Cooksey, 2007). Table 6.4 gives a sample list of the items in the Intellectual category showing Cronbach's α if a particular item were deleted. The table for each category is in Appendix 22. For the 14 items in the Intellectual category the highlighted items could be deleted, but it would only reduce Cronbach's α by a minimal amount. For the 26 items in Academic difficulties, the inter-item correlation shows that Cronbach's α would remain at a score of at least .96 irrespective of which items are deleted. However, I reviewed the correlation matrix provided in the Cronbach's α output and found two items connected to spelling difficulties that are highly correlated (Spelling difficulties and Phonics difficulties), so I temporarily removed the phonics item. I also did this for the two items connected to concentration, namely "Experiences challenges with concentration" and "Has difficulty remaining focused during more cognitively challenging tasks" and removed the latter item. Cronbach's α, remained high at .96. Similarly in the Socio-emotional sub-scale the rounded up score of .96 remained at ≥ .95 regardless of the removal of any of the items.

Table 6.4: Cronbach's alpha if item deleted from the Intellectual category

Checklist Section A: Intellectual	Cronbach's Alpha if item deleted
Achieves a high score in one or more components of an ability test or in a school standardised test	.914
Excels at tasks requiring abstract thinking and problem solving	.910
Learns new concepts quickly and easily	.916
Has natural flair in science and/or 'space and geometry' in mathematics	.918
Shows very high ability/skill in one or more areas	.921
Asks in-depth and challenging questions	.903
Reveals an in-depth knowledge of an area of high interest	.908
Uses an extensive and advanced vocabulary	.906
Shows advanced reasoning skills in responses to difficult questions	.909
Grasps concepts all at once rather than step by step	.910
Comprehends very easily	.910
Shows advanced insights about complex topics	.904
Excels in puzzles and mazes	.917
Has excellent visual memory	.920

Note. Cronbach's Alpha for the Intellectual Domain = .92; Highlighted items indicate that removing one or the other reduces score to approximately .905

There were also two categories, Perceptual and Motor control, that had scores less than .7 and they were reviewed to determine whether their inter-item correlations although not being very low, could still be improved. In terms of their consistency, these two categories were not improved by deleting any items and maintained their ranking of .67 and .61 respectively.

6.1.7. Determining whether the categories correlate

The second statistics' test used to explore usefulness was Spearman's Rank Order Correlation, also known as Spearman's rho (Field, 2013), which provided an analysis of how the nine categories were correlating together (Appendix 23). In effect, this technique gave a correlation and significance score for each category as compared to each of the other eight categories. As noted in the Methodology of Chapter 4, each teacher had used the TCQ to rank an average of two to three selected participants individually, from his/her class on all items in each of the nine categories. Because the TCQ is a 6-point Likert scale, teachers had selected one of six descriptors for every question (item) – Not applicable, Not observed, Uncertain, Sometimes, Often or Always.

The results of the Spearman's rho test appear in Table 6.5 and indicate some significant and strong correlations. Based on Cohen's guidelines (1988) for interpreting *r* values, or correlation coefficients, .10 to .29 = small effect, .30 to .49 = moderate effect, and .50 and above = large effect (Field, 2013; Pallant, 2013). For Section A of the TCQ, which comprises categories of possible significant learning potential in both the Mental and Physical domains, results show that there is a strong, positive correlation between the Intellectual and Creative categories, (significant at the level of $p < .01$), indicating that when a child is ranked highly in one, he/she is likely to rank highly in the other. There are also moderate positive correlations between the categories, Intellectual and Motor control, and Social and Creative – all significant at $p < .05$. It is evident, therefore, that four of the six categories have a correlated partner. The Muscular and Perceptual categories, however, show no significant correlations.

The rank order correlations for Section B, which represent three categories of indicators of possible learning difficulties , namely, Academic Difficulties, Socio-emotional and Other behaviours, are robust, showing strong and significant correlations between all the categories. There is a strong, positive correlation between Socio-emotional and Academic difficulties, which suggests that in this sample, Socio-emotional and Academic difficulties coexist prominently. In addition, Socio-emotional has a strong, positive correlation to Other behaviours and also has a similar strong correlation to Academic difficulties. All Section B category correlations are significant at $p < .01$.

Table 6.5: Spearman Rank Order Correlation of Checklist results for Section A (Mental and Physical categories) and Section B (Learning difficulties)

	SECTION A						SECTION B		
	Intellectual	Creative	Social	Perceptual	Muscular	Motor Control	Academic	Socio-emotional	Other behaviours
Intellectual		.66**	.23	.32	-.21	.45*	-.38	.15	-.02
Creative			.41*	.38	-.26	.21	-.29	.23	-.01
Social				.13	.03	.01	-.46*	-.23	-.37
Perceptual					.31	.32	-.01	.40	.38
Muscular						.35	-.24	-.22	-.15
Motor control							-.34	-.13	-.13
Academic difficulties								.61**	.77**
Socio-emotional									.81**
Other behaviours									

Note. Intellectual, Creative, Social, Perceptual, Muscular and Motor control are the Section A categories (Indicators of significant learning potential) and Academic, Social- emotional and Other behaviours are the Section B Categories (Indicators of possible Learning difficulties); Yellow highlight = large *r* effect size and significant at p < .01; green highlight = medium *r* effect size and significant at *p* < .05

*$p < .05$, **$p < .01$

In comparing Sections A and B of the Checklist, there were mixed findings. A significant negative correlation is evident between Academic difficulties and the Social category ($p < .05$), meaning that where either of these categories features prominently, there is a significant contrast in the other. There is a moderate negative correlation between both the Social category and Other behaviours ($r = -.37$) and between Academic difficulties and the Intellectual category ($r = -.38$), as well as a moderate positive correlation between the Socio-emotional and Perceptual categories ($r = .40$); however these scores are not statistically significant.

6.1.8. Preliminary analyses – Discussion

Table 6.6 includes a summary of the relevant Literature review conclusions and Study findings relevant to the preliminary analyses. This summary will assist the discussion of the TCQ's usefulness, focusing particularly on internal reliability and category correlations as important steps in determining validity and reliability. The section commences with a review of the demographic findings.

6.1.8.1. The teacher demographics

Besides the typical greater ratio of female to male teachers, the findings in terms of exposure to pre-service training and/or professional development suggest that the teacher participants had some knowledge of giftedness, either through pre-service exposure to gifted education and/or professional development and/or in the case of one teacher, extra tertiary training. Of note is the observation that of the three teachers with less than or equal to four years of teaching, there was still one who had no pre-service training in giftedness, nor learning difficulties. Interestingly, 30% of the teacher cohort reported no pre-service training in learning difficulties. Whilst the school site, at the time of the Study, was already focusing on the attributes of gifted/high-ability underachievers, the variation in teacher exposure to training may have had an influence on teacher understanding of 2e. It is important also to note that although the demographics indicate some training in gifted education, more so than in learning difficulties, this finding alone cannot vouch for the quality of the training.

Table 6.6: Preliminary analysis –demographics and TCQ structure (summary)

<table>
<tr><td colspan="2">Phase One Question: What are the components of a comprehensive, useful checklist for the preliminary stage of identifying possible gifted children with learning difficulties?</td></tr>
<tr><td colspan="2">Methodology: Mixed Methods Research; Research design: Participatory Action Research
Methods:
C: Data collection — Quantitative and qualitative
C: Data analyses — Demographics (descriptive statistics), internal consistency (Cronbach's alpha), correlations (Inferential statistics —Spearman's rho)</td></tr>
<tr><td>Literature review</td><td>Study C: Development of a comprehensive, useful checklist questionnaire (Preliminary analyses – Demographics and Checklist structure)</td></tr>
<tr><td>Conclusions
1) No literature available to compare results of the TCQ findings;
2) Higher proportion of gifted intellectual and creative traits noted in literature (Section 2.3.2);
3) Boys tend to feature more in certain LD (Montgomery 2009)
4) Problem of "invisible underachievement"(NSW DET, 2004, Underachievement, p. 6); and
5) Implied and explicit teacher attitudes can affect questionnaire responses (Glock & Kovacs, 2013).</td><td>Findings
Demographics of teacher participants
1) One teacher had extra tertiary training in gifted education;
2) 50% had exposure to pre-service training in gifted education compared to 30% in learning difficulties;
3) Most teachers exposed to professional development in both areas; and
4) Teachers were homogeneous in terms of religious and socio-economic background/
Demographics of child subjects
5) Selected from Years 2 to 6; and
6) Ratio of girls to boys of 3 to 2 in Years 2 to 6, and Years 3,4,& 5 boys outweigh girls 3 to 1 and in Year 5, 5 to 1.
Mean results
7) Higher rankings evident in Section A as compared to Section B Internal consistency and inter-item correlations;
8) Most Checklist categories have very strong internal consistency but Perceptual and Motor Control are lower;
9) Too few items in Social category to measure; and
10) Four categories have very high Cronbach's scores above 0.90 warranting review of inter-item correlations.
Correlations
11) Strong, positive correlations between Section A Intellectual and Creative, and between all Section B categories;
12) Moderate positive correlations in Section A between Motor control and Intellectual, Social and Creative, and Motor control and Perceptual; and
13) Muscular category has no significant correlations.</td></tr>
</table>

Note. Adapted from Cornish (2012)

6.1.8.2. Child subjects' demographics

The child subjects were taken from Years 2 to 6 owing to findings that the LD component of GLD (2e) children within the key learning areas of the primary- school curriculum may become more evident in these years, depending on the nature of the learning difficulties (Rogers, 2012). The results indicate that apart from two classes, boys far outweigh girls in their inclusion as subjects. Interestingly, by Year 6 the ratio had levelled out with girls being in a ratio of 3 to 2. For such a small sample of 24 children this observation may have little relevance – perhaps chance, or possibly it may reflect some negative teacher attitudes towards very capable boys who may have confronting learning difficulties

(Preckel et al., 2015). It may even be possible that of the boys remaining in Year 6, the percentage with learning difficulties may be higher (Literature Review Conclusion 4 (LRC 4) (Montgomery, 2009). Future trialling would be essential to draw any conclusions.

6.1.8.3. Mean rankings

Generally the mean rankings of the child subjects (Table 6.6, Finding 6), indicate that teachers were allocating higher rankings in the Section A categories and were more conservative in their estimates of learning difficulties, with several exceptions. As a cohort, greater strengths were observed in the Social, followed by Intellectual and Creative categories with only two children scoring above the ranking of Sometimes in the Perceptual category. Several subjects featured in the Sometimes range in learning difficulties. The high incidence of rankings in the Uncertain to Sometimes range for the Perceptual category could reflect teacher uncertainty about the nature and assessment of the traits, and the fact that completion of the TCQ did not allow for an extended time period for reflection due to school time-table constraints. These findings might suggest that the use of the TCQ in a school would ideally require more time for teacher consideration – to enhance the chance of greater assessment accuracy.

The generally lower rankings of learning difficulties may have several causes important to considerations of the usefulness of the TCQ. Firstly the results may be an 'accurate' reflection, but could also be connected to concerns about both giving rankings in learning difficulties where there may be uncertainty, as well as concerns about indicating that there may be issues in an independent questionnaire. This latter possibility is developed by Glock & Kovacs (2013) in their findings that in a Likert questionnaire such as the TCQ, which requires contemplation of the children's traits, there can be a tendency for teachers to give more positive appraisals (LRC 6). These possibilities emphasise the importance of explanation of both the TCQ's assessment procedures and how the data are to be used.

The next section pursues the question of the internal consistency or reliability of the TCQ categories.

6.1.8.4. Internal consistency and inter-item correlations

Most categories indicate high internal consistency meaning that the items are correlating or gelling well together. The two exceptions are Perceptual and Motor Control. The positive results are influenced by the comprehensiveness of the TCQ in terms of the

teacher focus-group's selection criteria and the refinement process to enhance the face validity of the tool.

The results for the Strengths categories are encouraging but the very high Cronbach's α scores in the case of the Intellectual category and Section B categories suggest that they could be streamlined in terms of refining and reducing the number of items. However, this process would require a factor analysis of results from a much larger sample size "to reduce a large number of related variables to a more manageable number" (Pallant, 2013, p.188). A small number of items could be removed apropos of Cronbach's Alpha if Item Deleted lists, but any advantage to be gained would be minimal, because the overall high scores would remain. Furthermore, for comparison purposes with future trials of the TCQ, it is preferable that the scale remains the same (Pallant, 2013) and then a factor analysis would be warranted. As indicated in the previous chapter, there is also an advantage for teachers to have a comprehensive range of items to increase opportunity for observation.

The Perceptual category is an interesting one. F. Gagné (personal communication, September 7, 2013) indicated that the Perceptual domain is the least researched of the six Natural ability domains in the DMGT 2.0; 2008 update, (Gagné, 2010). Prior to the teacher focus-group session, which focused on developing the TCQ, I had researched the literature and found reference to the items selected in Gagné's DMGT 2.0 (Perceptual domain) related to the senses of vision, hearing, smell and taste. Touch and proprioception are also referred to in the DMGT 2.0, but I felt these senses would be more challenging for teacher assessment. Even the items included in the TCQ would require consultation with parents/care givers if the information wasn't already known.

The reservation with the present Perceptual category is that the items tend to cover multiple constructs , that is, sound, vision, taste, smell and in-depth level of perception, so I was surprised that although Cronbach's α was less than the other categories (.67) apart from the Motor Control category, the score is not a low measure of internal consistency. It would be expected that with items that have "little in common", there would be a lower Cronbach's α (Drost, 2011, p. 112). To achieve the purpose of the TCQ in detecting the existence of giftedness/high ability in multiple domains of human endeavour, I would leave the present Perceptual items in the TCQ.

Although the Motor Control category has a Cronbach's of .61, which is the lowest of the category scores, it is not realistic to over interpret this result. Pallant (2013) indicates that

Cronbach α measurements can be influenced by the number of items and a sub-scale with fewer than 10 items can yield a lower result. However, this view is not always the case, as evidenced by the Social category of .80. In spite of reference to Cronbach's α being used in the literature with fewer than 10 items (Cooksey, 2007), the strongest influence on the sub-scales' internal consistency is how well the items are correlating together. As noted in the discussion about the Perceptual category, it is likely that the diverse items in the Motor Control category, including "quick reflexes", "drawing with precision" and "manual dexterity" contributed to lower Cronbach's α. Although still relevant, they would ideally require more representative items to secure greater clarity about the construct.

Another question arising is whether the TCQ with its main focus on the Intellectual and Creative categories, has too few items in the Muscular, Social and Motor Control categories to achieve its purpose as an assessment tool. The result of one child subject who only received a very high ranking in Muscular abilities suggests that including these categories supports the intention of the TCQ. The small number of items could be left as they are, or, as indicated, further investigation into further traits for these categories may be warranted. It is agreed that running a Cronbach's test on few items is questionable, but as part of the exploratory nature of the Study it was of interest to check all the sub-scales (apart from the Muscular), to gain a sense of whether the combination of items are showing promising trends in internal consistency.

6.1.8.5. Reviewing the category correlations

The next section of the analyses focused on exploring if there were any categories that may be correlated or show an association. It was indicated previously that the literature traits of giftedness tend to be more representative of the Intellectual (Bees, 2009; Gagné, 2010; Potential Plus UK, 2014-2017; Rogers, 2012) and Creative categories (Gagné, 2009), so it was not surprising that in the Spearman's rho measure of correlations, there was a strong, positive correlation between these two categories, significant at $p < .01$, although as has been established none of the child subjects was diagnosed as gifted. Other similar robust findings in the correlations were noted between all of the Section B categories, Academic difficulties, Socio-emotional and Other behaviours, significant at $p < .01$. In relation to the strong correlations of Section B, the significant negative correlation between Academic difficulties and Social strengths ($r = - 0.46$, $p < .05$) was not unexpected.

The key point of particular relevance to the Study was centred on the weak negative correlation (*r* = -.38*)* between the Intellectual category and Academic difficulties. It would be reasonable to anticipate that a cohort of diagnosed GLD (2e) children with intellectual strengths and LD, would have a positive correlation between the Intellectual and Academic difficulties categories, because of the likelihood of exceptionality in both intellectual strengths and academic difficulties (Assouline et al., 2010; Brody & Mills, 1997; Munro, 2005a). Whilst it would be expected in the general population for there to be a weak to moderate negative correlation, it was still not surprising to observe a similar trend in the results of the Trial, due to the nature of the groups. It will be recalled that Group 1 had high standardised test results but no evident learning difficulties, Group 2 a similar profile, but with possible learning difficulties, and Group 3, possible hidden ability, but with low to average standardised test results. In effect, the groups reflect the general distribution of the general population.

A further important point arising from the correlational analysis was that the Muscular control category showed no significant correlations. Whilst independence from the other categories may be implied, a greater number of items is needed before any interpretation can be made.

From the findings and discussion of the preliminary analyses, the TCQ's scale reliability (Cronbach's α) and some category correlations are encouraging and suggest it has a sound structure as an assessment tool, with scope for some further refinement. It is noted that not all of the Section A categories would be expected to have a strong correlation owing to different interpretations of strengths in each category (Gagné, 2008). The following section adds a further layer to addressing the question of a useful assessment tool for the preliminary stage of identifying GLD (2e) children.

6.2. Individual and group comparisons

Besides the preliminary analyses of the TCQ's structure, it is necessary to compare individual and group results of teacher rankings of the child subjects to assess whether it is useful for teachers as a practical assessment tool. To determine the TCQ's practical usefulness for detecting multiple strengths and learning difficulties, the procedures outlined in Chapter 4 include:

- graphing child subjects' scores in Year levels (Figure 6.1) to observe individual trends and variations in each Year level;
- recording children's average Likert scores for each category in their three nominal groups (Tables 6.7 & 6.8) (to compare results within each group); and
- graphing scores to explore any variations between the groups (Figure 6.2)

It was expected that the visual representation of group variations would give an indication of the TCQ's functionality and, therefore, usefulness for teachers. In addition, these comparisons were important in determining if there was any evidence of consistency between the TCQ ranking scores and the criteria for the child subject's selection, namely their standardised test results as well as teacher perceptions. I was particularly interested to see if there were any children who may have a pattern of results perhaps typical of 2e.

6.2.1. Variations in individual and year-level results

The first part of the analysis of individual and group results focused on the graphed mean scores for child subjects by year level, in each category. The results for each child are varied (Figure 6.1) both in their ranking in each category and in overall trends. There are examples where individuals show marked strengths and/or learning difficulties. Child subject ID: 4, for instance, features prominently in five of the Section A categories, but does not show any patterns of learning difficulties. In Year 5, ID: 17 has very high ranking in the Muscular category, but there is uncertainty about his ability in most of the other Section A categories. He tends to show more learning difficulties in Section B than the other participants. In Year 6, the results for ID: 22 suggest marked learning difficulties, but apart from a high ranking in the Section A Creative category, there is uncertainty about his other abilities.

The pattern of results between the year levels is also diverse. There is a predominance of strengths as compared to possible learning difficulties in Years 2 to 4, a more even distribution in Year 5, and in Year 6 a more varied pattern with lower scores in the Perceptual and Muscular categories. In Year 2, two of the five children with at least one high standardised test result were ranked prominently in the Intellectual category, as compared to none in Year 5, and for Year 6, four of the five children indicate moderate to high rankings. To achieve the ranking of very high, the children required a score in the Likert scale of 5 to 6. Most year levels in the school from Years 2 to 6 had two classes,

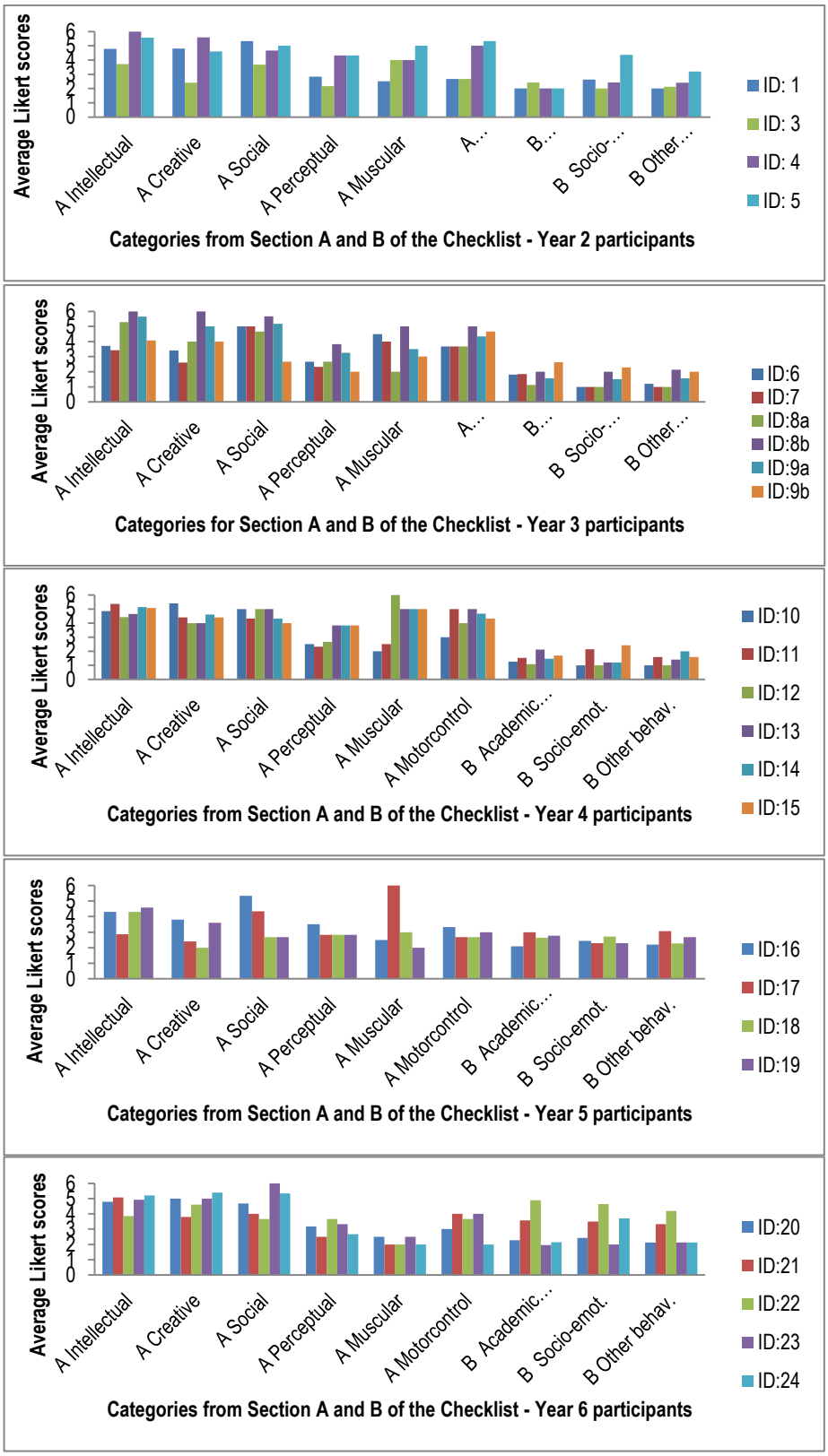

Figure 6.1: TCQ averaged results in Year levels for each child participant

with each class teacher completing the TCQ. Year 3 also had two classes, one taught by a full-time teacher and the other with two job-share teachers. There was only one class of Year 5's with one teacher respondent. There were, therefore, nine classes altogether, with

eight full-time teachers as well as two job-share teachers completing the TCQ Trial. Overall, the graphs provide a clear indication of the patterns and trends of strengths and possible learning difficulties across the nine categories.

6.2.2. Results of the three Trial groups

Graphed results were used to find the average Likert scores for each child subject. The children and their scores are shown in their trial groups in Tables 6.7 and 6.8. Generally more variation is observable in strengths in each of the groups, as compared to indicators of learning difficulties.

Group 1 High standardised test result

The Trial findings affirm that in the High standardised test result group of seven child subjects (eight units of observation due to one child having two teachers), there are strengths in the Intellectual category with three children being ranked in the 5–6, or 6 range and four in the Sometimes – Often range of 4–5. This pattern is similar in the Creative category. There are also strengths noted in the Muscular category and, interestingly, in the Social category most of the group is clearly ranked at 5 and above. The measure to indicate strengths is an average score of 5, 5–6 or 6, corresponding to Often or Always in the TCQ. It is also noted that one child (ID: 10) shows variation in results, with the change from very high Waddington Reading results in Year 2, to the above average/high scores in her TORCH stanine. Overall, there are no indications of learning difficulties and the results reflect the children's high standardised test results and teacher support for their inclusion in Group One (Table 6.7).

Group 2 High standardised test results and possible learning difficulties

The findings for the second group of child subjects, High standardised test result/s and possible learning difficulties, tend to be somewhat inconclusive in terms of whether there was a combination of any notable strengths and difficulties. Although five of the children show an average score of 5 to 6 in the Intellectual category and 4 in Motor control, there were only two who indicate possible learning difficulties. One shows possible socio-emotional needs and the other possible needs in all three categories of learning difficulties – Academic, Socio-emotional, and Other behaviours. It is important to note that because the Section B categories include multiple items, ranging in number from 14 in Other behaviours to 26 in Academic difficulties, any averaged result would not indicate the

specific variations seen in the individual scores in Figure 5.2. It is also noted that the TORCH stanines of ID: 20 have generally declined during 2011/2013. Overall, the standardised test results shown in Table 6.8, suggest that the group is slightly stronger in the Intellectual category than Group 1.

Group 3 Possible hidden/ uncertain abilities and low-to-average standardised test result

The Study included seven Group 3 children with possible 'hidden', or 'uncertain' abilities. These children could be achieving low-to-average results, and yet could also have possible high ability and learning difficulties. The results from Table 6.7, show that job-share Teacher 2 (ID: 9a) ranked ID: 9 as having have strengths intellectually and in Motor control, but in Academic difficulties the teacher gave an above-average ranking in the Sometimes- to-Often range. Child ID: 17 did not feature strongly in the Intellectual domain but excels in the Muscular domain and there are indications that there is uncertainty about his rating in the Academic and Socio-emotional categories. His results show more variation in the Section B category of Other behaviours. Another subject ID: 22 shows Creative strengths as well as above-average results in all of the Section B possible learning difficulties categories. Apart from one child ID: 7, the other six subjects all show at least one result in the Uncertain-to-Often range in Section B. Overall, the children's abilities are not conclusive and would suggest the need for further review with other assessment strategies. Groups 3's standardised test results include the stanine range over the two year period of 2011/2012 to illustrate inconsistencies. It is noted that ID: 7 (Year 3) has results for Waddington Reading (Waddington, 2000) as well as TORCH (Mossenson et al., 2003), because it was felt by the School that she was underachieving. Her follow-up TORCH (Mossenson et al., 2003) is scored at Stanine 8 which is a higher result than she achieved in the Waddington Reading test (Waddington, 2000) (Table 6.8 &Appendix 18).

Table 6.7: Checklist: Average results of Section A and Section B categories for Group 1

Trialling Group 1: High standardised test results		Highest standardised test result 2011/2012	Section A: Indicators of possible significant learning potential						Section B: Indicators of possible learning difficulties		
			Mental domains/categories				Physical categories		Academic difficulties	Socio-emotional	Other
Child participant ID number Year level and gender			Intellectual	Creative	Social	Perceptual	Muscular	Motor control	Academic difficulties	Socio-emotional	Other behaviours
1	Year 2 girl	R (2-3 years above)	4–5	4–5	5–6[a]	2–3	2–3	2–3	2	2–3	2
6	Year 3 boy	R (4-5 years above)	3–4	3–4	5[a]	2–3	4–5	3–4	1–2	1	1–2
8a	Year 3 boy(JS1)	R (3 years above)	5–6[a]	4	4–5	2–3	2	3–4	1	1	1
8b	Year 3 boy(JS2)	As above	6[a]	6[a]	5–6[a]	3–4	5[a]	5[a]	2	2	2–3
10	Year 4 girl	R (5 years above), M (Stanine 8)*	4–5	5–6[a]	5[a]	2–3	2	3	1–2	1	1
12	Year 4 boy	R (Stanine 9), M (Stanine 9)	4–5	4	5[a]	2–3	6[a]	4	1	1	1
14	Year 4 boy	R (Stanine 6), M (Stanine 8)	5–6[a]	4–5	4–5	3–4	5[a]	4–5[a]	1–2	1–2	2
23	Year 6 girl	R (Stanine 9), M (Stanine 9)	4–5	5[a]	6[a]	3–4	2–3	4	2	2	2
7 child subjects (8 cases)											

Note. Abbreviations: R = Reading age (Years 2 and 3 Waddington Reading), Years 4 to 6 (TORCH); M = Mathematics (PAT); Superscript [a] = median scores: Often to Always from the 6-point Likert scale; JS1 = job-share Teacher 1, JS2 = job-share Teacher 2; Scores: 1 = Not applicable, 2 = Not observed, 2–3 = in the range between Non applicable and Not observed, 3 = Uncertain, 4 = Sometimes, 3–4 = between Uncertain and Sometimes, 5 = Often, 6 = Always, 5–6 = between Often and Always; One asterisk in Highest standardised test results = variations between results in test types (Waddington and PAT)

Table 6.8: Checklist: Average results of Section A and Section B categories for Groups 2 and 3

Trialling Group 2: High standardised tests and possible Learning difficulties (10 child subjects)		**Highest standardised test result 2011/2012 ('years above' refer to results above chronological age in Year 1 or 2 – Waddington Reading)**	**Section A: Indicators of possible significant learning potential**						**Section B: Indicators of possible learning difficulties**		
			Mental domains/categories				Physical categories				
Child participant ID number	Year level and gender	**Stanines (TORCH or PAT Maths)**	Intellectual	Creative	Social	Perceptual	Muscular	Motor control	Academic difficulties	Socio-emotional	Other
2	Year 2 girl	R (2–3 years above)	4–5	4–5	4	3–4	4	3–4	2	3-4[b]	2-3
4	Year 2 girl	R (4–5 years above)	6 [a]	5–6 [a]	4–5	4–5	4	5 [a]	2	2-3	2-3
5	Year 2 boy	R (beyond test ceiling)	5–6[a]	4–5	5 [a]	4–5	5[a]	5–6[a]	2	4-5[b]	3- [b]
11	Year 4 boy	R (3–4 years above), M (Stanine 9) *	5–6 [a]	4–5	4–5	2–3	2–3	5[a]	1–2	2	1-2
13	Year 4 boy	R (1year above), M (Stanine 8)	4–5	4	5[a]	3-4	5[a]	5[a]	2–3	1-2	1-2
15	Year 4 boy	R (Stanine 8), M (Stanine 9)	5–6 [a]	4–5	4	3–4	5[a]	4–5	1–2	2-3	1-2
16	Year 5 girl	R (Stanine 8), M (Stanine 8)	4–5	3–4	5–6[a]	3–4	2–3	3–4	2	2-3	2-3
18	Year 5 boy	R (Stanine 9), M (Stanine 9)	4–5	2	2–3	2–3	3	2–3	2–3	2-3	2-3
20	Year 6 girl C/S (Case study)	R (Stanine 8), M (Stanine 9)**	4–5	5	4–5	3–4	2–3	3	2–3	2-3	2
24	Year 6 girl C/S		5–6 [a]	5–6[a]	5–6[a]	2–3	2	2	2–3	3-4 [b]	2-3
Group 3: 'Hidden'/uncertain ability 7 child subjects (8 cases)											
3	Year 2 boy	R (one year above),	3–4	2	3-4	2	4	2–3	2–3	2-3	2-3
7	Year 3 girl	R (2–3 years above), R (Stanine 8)	3–4	2–3	5[a]	2–3	4	3–4	1–2	1	1

Trialling Group 2: High standardised tests and possible Learning difficulties (10 child subjects)		Highest standardised test result 2011/2012 ('years above' refer to results above chronological age in Year 1 or 2 – Waddington Reading)	Section A: Indicators of possible significant learning potential						Section B: Indicators of possible learning difficulties		
			Mental domains/categories				Physical categories				
Child participant ID number Year level and gender		Stanines (TORCH or PAT Maths)	Intellectual	Creative	Social	Perceptual	Muscular	Motor control	Academic difficulties	Socio-emotional	Other
9a	Year 3 boy (JS1 C/S)	R (1 year above)	4	4	2–3	2	3	4–5	2–3	2-3	2
9b	Year 3 boy (JS2)		5 [a]	4–5	3–4	3–4	2	5[a]	4–5	2-3	3- [b]
17	Year 5 boy C/S	R (Stanine 5–7)**, M (Stanine 6–7)	2–3	2–3	4–5	2–3	6[a]	2–3	3	2-3	3-4[b]
19	Year 5 boy	R (Stanine 5–7)**, M (Stanine 7)	4–5	3–4	2–3	2–3	2	3	2–3	2-3	2-3
21	Year 6 boy C/S	R (Stanine 5), M (Stanine 6–7)	5	3–4	4	2–3	2	4	3–4	3-4[b]	3-4[b]
22	Year 6 boy C/S	R (Stanine 6–8)*, M (Stanine 5–9)*	3–4	4–5	3–4	3–4	2	3–4	4–5	4-5[b]	4-5 [b]

Note. R = Reading age and M = Mathematics; C/S = case-study participant; Superscript[a] in Section A = Often to Always from the 6-point Likert scale; Superscript in Section B = scores of particular interest; One asterisk in Highest standardised test results = variations between results in test types (Waddington and PAT) and two asterisks = decline in or variation between reading scores; PAT Maths = Progressive Achievement Test in Mathematics (used in School from Years 3 to 6); TORCH = Test of Reading Comprehension (Years 3 and above); Highlight yellow = ID: 7 was tested on TORCH in Year 2 as well as Waddington

6.2.3. Comparing average results between the groups

To ascertain whether the TCQ was detecting differences between the groups, I graphed their mean results for each category. (I selected out one of the job-share teacher's results for the group comparisons.) Figure 6.2 shows that the combination of the TCQ's categories/ items is useful to detect multiple differences.

Section A

In Section A, Group 3 children, whose possible high-ability characteristics may be hidden, are ranked consistently lower than Groups 1 and 2 in the Mental categories (Intellectual, Creative, Social and Perceptual) apart from the Perceptual category. In the Physical categories of Muscular and Motor Control, there is a more even distribution between the three groups. From these results, Group 3 children collectively do not seem to have strengths in the Mental categories; however, in all cases there appears to be a score in the 3–4 range (Uncertain to Sometimes), suggesting some teacher uncertainty. Overall, the three groups have comparable scores in the Perceptual, Muscular and Motor control categories.

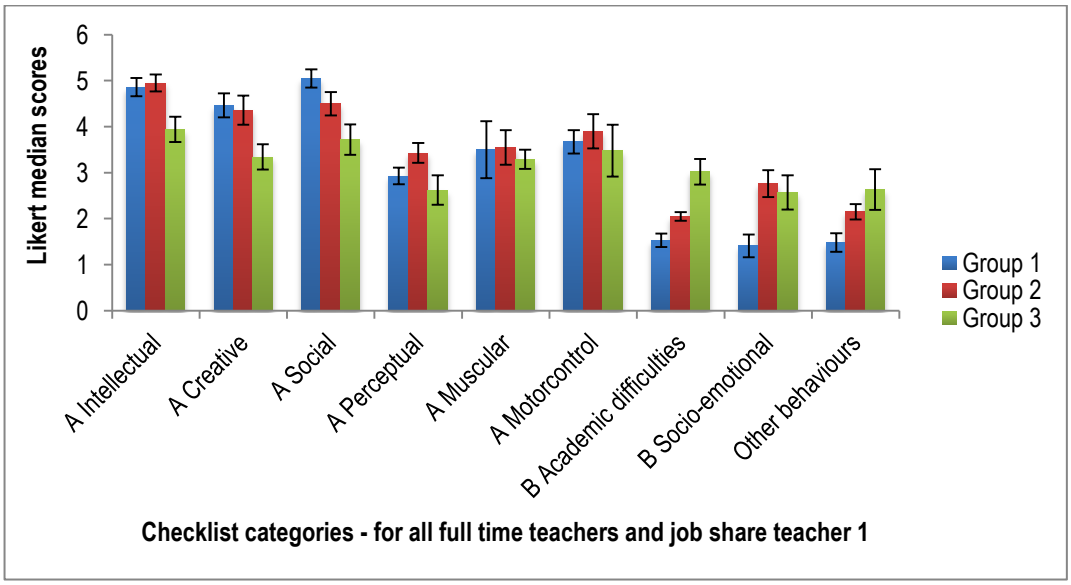

Figure 6.2: Group median scores in all Checklist Section A and B categories
Note. Standard error bars are included to indicate the standard deviation of the mean

Section B

In the three categories of learning difficulties: Academic, Socio-emotional, and Other behaviours, there are similar patterns and variations. Group 1 is ranked consistently as not indicating learning difficulties. Group 3's pattern of being ranked in the Uncertain- to-

Sometimes range in the Mental categories is matched by similar scores in the three learning difficulties categories of Section B. In Academic difficulties, Groups 1 and 2 have a lower ranking compared to Group 3, which tends to reflect a similar, although less marked higher ranking in the Intellectual strengths of Section A. Interestingly, Group 2 (high standardised test result and possible learning difficulties) is ranked more closely with Group 3 in the learning difficulties of Socio-emotional and Other behaviours, and in fact is higher than Group 3 in the Socio-emotional category.

Based on the graphed results of the groups' median scores, Groups 1 and 2 seem to have greater strengths than Group 3 in Section A of the TCQ, with a more even distribution in the Perceptual, Muscular and Motor control categories. Although the rankings for Section B fall within the Not-applicable to Sometimes range, the pattern indicates a consistent lack of noticeable learning difficulties for Group 1 and more marked queries about Groups 2 and 3 in the categories of Socio-emotional and Other behaviours.

6.2.4. Statistical analysis of differences in the groups' results

To determine whether there was significant difference in the average results of the three trial groups, I conducted the inferential Kruskal-Wallis *H* test. This test is useful where group sample sizes are small and where the normality of the distribution is unknown (Elliott & Woodward, 2007). It measures significance "on the basis of mean ranks rather than mean scores" (Cooksey, 2007, p. 230). If the resulting test statistic *H* (chi-square) is significant, this means that there is a significant difference in the construct being measured across the groups (Pallant, 2013), as evidenced in the category Academic difficulties, $H(2) = 13.66$, $p < .001$. I used the results of all eight full-time teacher participants as well as the randomly selected results of job-share Teacher 1. The Kruskal-Wallis test results are shown in Table 6.9.

The Kruskal-Wallis *H* test results (Appendix 24) indicate that based on the critical alpha value of $p = .05$ there is significant difference, shown in Table 6.9 across the groups in six of the nine categories: Intellectual, Social, Perceptual, Academic difficulties, Socio-emotional, and Other behaviours. However, the chance of obtaining the result in the Academic difficulties category was statistically very significant, $H(2) = 13.66$, $p = .001$.

Table 6.9: Kruskal-Wallis *H* test results for Checklist categories

Selected Checklist category	Groups 1 to 3	Number	Mean rank	Chi-square	Degrees of freedom	Significance
Intellectual	1	7	14.00	7.20	2	.028*
	2	10	15.60			
	3	7	6.57			
Creative	1	7	15.00	5.75	2	.056
	2	10	14.50			
	3	7	7.14			
Social	1	7	17.36	8.15	2	.017*
	2	10	13.10			
	3	7	6.79			
Perceptual	1	7	11.50	6.01	2	.049*
	2	10	16.35			
	3	7	8.00			
Muscular	1	7	12.43	.52	2	.769
	2	10	13.55			
	3	7	11.07			
Motor Control	1	7	12.43	.86	2	.650
	2	10	13.85			
	3	7	10.64			
Academic difficulties	1	7	5.36	13.66	2	.001***
	2	10	12.75			
	3	7	19.29			
Socio-emotional	1	7	6.43	8.30	2	.016*
	2	10	16.35			
	3	7	13.07			
Other behaviours	1	7	6.57	7.46	2	.024*
	2	10	14.00			
	3	7	16.29			

Note. Critical alpha/significance level = .05; * p = <.05, ** p < .01, *** p ≤ .001

It will be recalled from Chapter 4 Phase One: Research methods, that even though Kruskal-Wallis *H* test measures the level of significance across the three groups in each category, it does not indicate which of the groups may be significantly different, so I conducted a follow up Pairwise comparison (Field, 2013), which is an added test option in SPSS. As the title suggests, this option compares differences between pairs of groups in categories but only where there are significant results in the Kruskal-Wallis *H* test. This meant that the categories Muscular (p = .769) and Motor Control (p = .650), and even the

Creative category which was close to significance (p = .056) were not included. The Pairwise comparison provides adjusted significance levels based on both the number of groups and the standardised test statistic (z-score), which allowed a calculation of the effect size (r) of group differences (Table 6.10). The effect size (r) is a standardised estimate of the magnitude of association (Ellis, 2010) which, in effect, means the "standardised mean difference" (Coe, 2002, p. 3) between the groups.

Referring to the mean rankings for each of the three groups in all of the categories (Table 6.9), and the Pairwise comparison with adjusted significance levels and effect size estimates (Table 6.10), there are interesting findings. In the Intellectual category, Group 2 has a significantly higher ranking than Group 3, but the difference between Group 1 and 2 is negligible. Also Group 1's ranking compared to Group 3 is significantly higher in the Social category of Section A. These comparisons also show large effect sizes (> r = .50) See bold figures in Table 6.10. Interestingly, although the difference between Group 1 and 3 in the Intellectual category is seen to be non-significant, there is still a large effect size (r = .526). Ellis (2010, p. 4) points out the not infrequent discrepancies between statistical significance and effect size: "It is quite possible and unfortunately quite common, for a result to be statistically significant and trivial. It is also possible for a result to be statistically nonsignificant and important".

In comparing the groups in Section B (Learning difficulties) of the TCQ, Group 1 is ranked significantly less in terms of possible difficulties than Group 3, with a corresponding high to very high effect size in both Academic difficulties and Other Behaviours. Of particular interest to the Study is that Group 2 has a significantly higher ranking of possible difficulties in the Socio-emotional category than Group 1 (p < .05) , yet shares a slightly higher/comparable ranking to Group 1 in the Intellectual category (adjusted significance level of p = 1.000). These comparisons also indicate large to very large effect sizes. In contrast it is Group 2 that has a significantly higher ranking in the Intellectual category than Group 3, with a large effect size (p = .028, r = .630), and yet both groups are ranked similarly in the Socio-emotional category showing a non-significant difference and with a small effect size, p = 1.000, r = .230. It is noted that in comparing Groups 1 and 2 in the category of Other behaviours, Group 2 has a marginally more significant mean ranking of possible difficulties, however the effect size is large, r = -.520, p = .096. In comparing Groups 2 and 3 in the same category, both received a similar high ranking of observed difficulties and subsequently the difference was non-significant,

and with a very small or inconsequential effect size, $p = 1.000$, $r = -.160$. Comparisons between all groups in Academic difficulties show marked differences in mean ranking (Table 6.9), but this contrast is only clearly significant between Groups 1 and 3. However the other two groups' comparisons indicate moderate to strong effect sizes.

Table 6.10:.Follow up Pairwise Comparison for Checklist categories

Checklist category	Groups 1 to 3	Significance	Adjusted significance (z)	√N	r
Intellectual	1 & 2	.646	1.000	4.12	- 0.117
	1 & 3	.049	.147	3.74	**0.526**
	2 & 3	.009	.028*	4.12	**0.630**
Social	1 & 2	.216	.648	4.12	0.300
	1 & 3	.005	.014	3.74	**0.757**
	2 & 3	.067	.200	4.12	*0.445*
Perceptual	1 & 2	.161	.484	4.12	- 0.340
	1 & 3	.351	1.000	3.74	0.250
	2 & 3	.016	.048*	4.12	**0.585**
Academic difficulties	1 & 2	.033	.100	4.12	**- 0.516**
	1 & 3	.000	.001**	3.74	**- 0.987**
	2 & 3	.060	.180	4.12	*- 0.456*
Socio-emotional	1 & 2	.004	.012*	4.12	**- 0.700**
	1 & 3	.076	.229	3.74	*- 0.473*
	2 & 3	.343	1.000	4.12	0.230
Other behaviours	1 & 2	.032	.096	4.12	**- 0.520**
	1 & 3	.010	.029*	3.74	**- 0.690**
	2 & 3	.510	1.000	4.12	- 0.160

Note. Group 1 = High ability; Group 2 = High ability and possible learning difficulties; Group 3 = possible Hidden ability; Adjusted significance is based on the second test on the same data Highlighted yellow = high significance level; √*N* = square root of the number of child subjects in the two groups; bold *r* effect sizes = a large effect and values in italics = moderate; Critical alpha/significance level .05; * p = <.05, ** p < .01

Overall, from the Kruskal-Wallis *H* test and the follow-up Pairwise comparison, clear trends are evident. There are significant differences across the three groups in six of the nine categories, Intellectual, Social, Perceptual, Academic difficulties, Socio-emotional, and Other behaviours. This trend parallels the column graph (Figure 6.2) where, interestingly, in each of these six categories there is at least one group standard error bar that does not overlap. From the follow-up analyses, including Pairwise comparisons with adjusted *p* values and calculated effect sizes, there are indications that Group 1 and Group 2 tend to feature more prominently in the mental categories of Section A. However, for Section B the results are more varied with Group 2 and 3 showing a similar higher ranking

of possible difficulties in the Socio-emotional and Other Behaviours. In Academic difficulties there are marked differences in ranking between the three groups with varying levels of significance, but with consistent high to very high effect size indications.

6.2.5. The TCQ's capacity to discern differences in results between genders

Research indicates that whilst gifted ability in boys and girls is similar (Kerr, Vuyk, & Rea, 2012), there can be a disparity in some LD, with boys featuring more prominently than girls. Montgomery (2011, p. 17) for instance, found that in her observation of gifted children with dyslexia, the overall ratio was 1.2:1 boys to girls. To explore whether this slight gender difference was identifiable from the Checklist results, the Mann-Whitney U test was used and the results shown in Table 6.11. Refer to Appendices 25 and 26 for gender comparisons and mean ranks in each of the TCQ categories.

The same table indicates that only in two of the categories Creative and Social, was there a rejection of the null hypothesis that the distribution of the variables/items is the same between genders. So, in this sample, there is only a significant statistical difference in the mean rank between males and females in the Creative and Social domains. However, this statistical significance needs to be viewed conservatively due to the small sample size. Interestingly, the effect size or substantive significance as shown by the *r* value for these domains is large. This judgement is based on Cohen's criteria that 0.5 reflects a "large effect" size (Cohen, 1998, as cited in Pallant, 2013, p. 238).

Table 6.11: Mann-Whitney U Test comparing Checklist results for boys and girls

Mann-Whitney U test comparing order of results in all sub-scales categories for males and females							
Category	**Gender**	**N**	**Mean rank**	**Mann-Whitney *U***	***z* value**	***p* value**	***r* value**
Intellectual	M F	15 9	12.00 13.33	60.00	-.448	.682	- 0.09
Creative	M F	15 9	9.70 17.17	25.50	-2.516	.010	- 0.51
Social	M F	15 9	9.47 17.56	22.00	-2.747	.005	- 0.56
Perceptual	M F	15 9	12.03 13.28	60.50	-.420	.682	- 0.09
Muscular	M F	15 9	14.03 9.94	44.50	-1.395	.174	- 0.28
Motor-control	M F	15 9	14.13 9.78	43.00	-1.472	.155	- 0.30
Academic difficulties	M F	15 9	13.23 11.28	56.50	-.657	. 519	- 0.13
Socio-emotional	M F	15 9	11.87 13.56	58.00	-.571	.599	- 0.12
Other behaviours	M F	15 9	12.77 12.06	63.50	-.240	.815	- 0.05

Note. Highlighted figures indicate significant differences

6.2.6. Individual and Group comparisons – Discussion

The following section uses the summary of the relevant Literature review conclusions and Study findings of Individual and Group comparisons (Table 6.12), to discern the TCQ's practical usefulness.

6.2.6.1. Individual and year level comparisons

As shown in the findings of Table 6.12, the visual information for individuals and for year level comparisons suggests that the TCQ is functional/useful in that it can provide teachers with multiple, preliminary data about individual children under review. This feature is influenced by the comprehensiveness of the TCQ, with the inclusion of Gagné's six natural abilities for giftedness/high ability, the three categories of learning difficulties based on evidential and anecdotal traits largely obtained from the literature. The variation of results is likely to reflect the child subjects' individual profiles, but also could be influenced by teacher differences in both their interpretation of the items and perceptions about each child. In the case of any possible GLD (2e) children in the cohort, their initial detection would understandably be dependent on teacher interpretation and judgement, which is compounded by problems of masking ability and/or LD (Davis & Rimm, 2004; Krochak & Ryan, 2007).

Table 6.12: Individual and group comparisons (summary)

<table>
<tr><td colspan="2">Phase One Question: What are the components of a comprehensive, useful checklist for the preliminary stage of identifying possible gifted children with learning difficulties?</td></tr>
<tr><td colspan="2">Methodology: Mixed Methods Research; Research design: Participatory Action Research
Methods:
C: Data collection –Quantitative – mean scores (individual and group); inferential statistics (group comparisons)
C:Data analyses – Descriptive statistics (graphs/tabulated results), Kruskal Wallis H Test</td></tr>
<tr><td>Literature review</td><td>Study C: Development of a comprehensive, useful checklist questionnaire (Individual and group comparisons)</td></tr>
<tr><td>Conclusions
1) No literature available to compare results of the Checklist findings;
2) Boys tend to feature more in certain LD (Montgomery, 2009);
3) Problem of “invisible’ underachievement” (NSW DET, 2004, Underachievement, p. 6); and
4) Teachers show uncertain ability to identify GLD (2e) (Wormald, 2011).</td><td>Findings
Individual comparisons
1) Variations in ranking in each category and overall trend, e.g., marked strengths and/or learning difficulties; and
2) Marked variations in pattern of results between classes.
Group comparisons – descriptive analyses
3) Average Likert scores show more variation in strengths compared to possible learning difficulties;
4) Group 1 shows some ‘strengths’ in the Intellectual, Creative and Muscular categories, with a high incidence of strengths in the Social category. No evident learning difficulties;
5) Group 2 has 50% of subjects with clear strengths in Intellectual, 40% in Social and Muscular. Only learning difficulties observed in 30% Sometimes- to-Often range in the Socio-emotional category; and
6) Group 3 has 20% of subjects with clear Intellectual ranking (one subject was scored by two teachers (4 and 5); one child ranked Always in physical category. Smattering of learning difficulties in 3–4 and 4–5 range in all Section B categories.
Statistical analysis of differences across the groups
7) Significant differences are evident across groups in Intellectual, Social, Perceptual and Section B categories with Academic difficulties being very significant.
Statistical significance between groups
(including Pairwise comparison, effect size and adjusted significance levels)
8) Group 1 and Group 2 tend to feature more prominently in the mental categories of Section A.
9) Results in Section B are more varied with Group 2 and 3 showing a similar higher ranking of possible difficulties in the Socio-emotional and Other Behaviours.
10) In Academic difficulties there are marked differences between the three groups with varying levels of significance but with consistent high to very high effect size indications.
Gender differences
11) Significant difference is evident between genders in Creative and Social categories but a small effect size.</td></tr>
</table>

Note. Adapted from Cornish (2012)

6.2.6.2. Group comparisons

The group comparisons via the average Likert scores, provide a clear picture of the diversity of strengths and to a lesser extent learning difficulties. Group 1 features most noticeably in the Social category with instances of strengths in the Intellectual and Creative categories, and as expected of a quasi-control group (Ziegler, Schimke, Stoeger,

& Merrotsy, 2010), there is no evidence of learning difficulties. Group 2 is parallel but with a greater percentage of children having Intellectual strengths and there are three children indicating possible learning difficulties in the Socio-emotional category. I was particularly interested to note that in Group 3 two children are noted with intellectual strengths and one socially, but in the Section B categories there are greater variations than in the other two groups. These variations between the groups, although suggesting the capacity of the TCQ to detect multiple strengths and learning difficulties, does not imply that amongst the 24 subjects there are representatives of the GLD (2e) population. Differences need statistical analyses to tighten the interpretation in relation to significance and effect size. What can be stated at this stage is that the TCQ is likely to have relevance as an assessment tool for various abilities in the classroom.

6.2.6.3. Statistical analysis of group results

Table 6.12 indicates that the non-parametric Kruskal-Wallis *H* test results reflect significant differences across the groups in six categories, particularly in the Section B categories. The key point to be made is that this statistical analysis is supporting the differences noted in Likert rankings in the three groups. Kruskal-Wallis indicates that teacher rankings of strengths and learning difficulties in the groups are indeed different.

It was noted previously that the Kruskal-Wallis *H* test does not indicate which groups are significantly different in terms of the construct being examined, so a Pairwise comparison was used for six of the TCQ categories: Section A: Intellectual, Social, Perceptual and Section B: Academic, Socio-emotional and Other behaviours. Overall, Group 1 and Group 2 feature more prominently in the Mental categories of Section A, which parallels their stronger overall achievement in at least one standardised test result. Group 3, as the 'unknown quantity', in terms of teacher uncertainty about their true ability, has a mean ranking in the Intellectual category that is not significantly different from Group 1 and yet, paradoxically, the effect size is large meaning that there are considerable differences in standardised mean rankings between the two groups. For Section B, in spite of Groups 1 and 2 having a higher mean ranking in the Intellectual category the key point of interest is that Group 2 and 3 have a similar higher ranking of possible difficulties in Socio-emotional and Other Behaviours. The reality of a small sample cautions over interpreting these results, but in terms of the 2e focus of the study, the finding that Group 2 children appear to have strengths in the Intellectual category and yet have a significant contrast to

Group 1 in Socio-emotional difficulties, might suggest that within the group, there may be children warranting a further investigation in terms of ability and learning difficulties. These results, together with other significant variations, indicate that the TCQ has the capacity to be a useful tool not only for the preliminary stage of identifying 2e, but also for all children in the classroom.

6.2.6.4. Gender differences

Exploring gender differences was not pivotal to addressing the question about the components of a useful questionnaire, but in the light of literature about some influence of gender on giftedness and LD (depending on the nature of the difficulty) (Montgomery, 2011), I felt it would be worthwhile to determine what the Trial of the TCQ would reveal. These data could add further support to the TCQ as a tool that has components that are of relevance to multiple abilities and gender. Overall, in this sample of child subjects the only significant difference (and with a large effect size), is in the Creative and Social categories. Again however, to obtain a more realistic picture, a larger sample is necessary.

Concluding the discussion on the Individual and group comparisons, it is important to refer to the question of Phase One regarding the components of a 'useful' Teacher Checklist questionnaire. There are positive indications that both the TCQ's structural components (reliable sub-scales, correlational categories) and practical usefulness for primary school teachers are indeed promising.

6.3. Further findings about teacher perceptions

To further investigate the usefulness of the TCQ, teacher perceptions were obtained from optional responses, comparisons between the job-share teachers, and from teacher reflections post the trialling phase. The collection of these data was seen as an instance of triangulation typical of Mixed Methods research.

6.3.1. Usefulness of the TCQ's optional open responses for teachers

The TCQ includes provision for teachers to record optional open responses 'Other observations/comments' and Table 6.13 shows the range of information teachers recorded in the allocated spaces in Sections A and B. Most teachers recorded additional written

responses, which are coded into themes, each with a number to indicate how many responses are relevant to the particular theme. For example, 'Social skills in at least one area = 3' means that there are three teacher responses that are the same/similar. From these scores the main underlying themes were determined and are recorded in the last row of the table. Appendix 17 shows the uncollated teacher open responses.

In Section A of the TCQ, the predominant themes arising from optional teacher responses are strengths in a specific subject area or interest and personal qualities. There was also a range of responses in Section B, which mainly centre on the themes of personal/confidence needs, particular mannerisms and, to a lesser extent, task avoidance. It is understandable that teachers may wish to record the particular subject or the personal quality of the child, or the nature of the possible learning difficulties. These responses are invaluable for clarification of the quantitative results and/or generally providing more insight about each child.

Table 6.13: Checklist open responses and other observations

Section A – Possible significant learning potential Responses made in checked response box or Other observations/comments	**Section B – Possible Learning difficulties** Responses to Other observations/comments	**Other observations** (by researcher)
Specific subject strength or keen interest = 24; Loves a challenge in subject strength = 1; Very creative = 1; Sporting prowess in at least one area = 4; Social skills in at least one area = 3; Personal/confidence needs e.g., anxiousness = 4; Personal progress e.g., behaviour = 1; Personal qualities = 7; Medical background = 1; Estimation of ability = 3 ; Inconsistency between results achieved, e.g., AGAT and other standardised test = 3; Uncertainty about at least one response = 3; Bi-lingual = 1; and Clarification added to checklist item e.g., question on Maths depends on concept area = 1.	Self-reliant = 1; Social/behavioural skills = 2; Task avoidance in at least one area = 4; Personal/confidence needs = 9; Particular mannerisms = 4; Perfectionism =1; High self - expectation = 1; Qualities that help learning= 2; (responses noted in Section B) Likes security = 1; Self-appreciative = 1; Bi-lingual = 2 (including indication in 'Possible significant learning potential' column); Family factors =1; Concentration/attention = 2; Specific learning difficulty =3; Performance influenced by interest =1; and Prefers communication with older children/adults = 1.	Two responses in the Intellectual domain were amended from Often to Sometimes after teacher's further consideration the next day. At same time the response in the Social domain was changed from Often to Sometimes.

Main themes in Section A	**Main themes in Section B**	**Summary of observations**
Specific subject area or interest, personal qualities	Task avoidance in at least one area, personal needs e.g., anxiousness, individual mannerisms	Subjectivity of responses according to context and time

Note: Highlighted text indicates the predominant responses; Numbered responses show how many times they were noted

6.3.2. Job-share teacher assessments

In the trial of the TCQ there were two job-share teachers both ranking two Year 3 participants in the one class, and although job-share Teacher 2 was randomly selected out, it was important to compare both teachers' results to determine any similarities and variations. In Figure 6.3 the average rank for child subject ID 8, is listed as ID: 8a and ID: 8b to indicate the evaluation by job-share Teachers 1 and 2 respectively. This use of lower case letters to denote the separate scoring is also shown for ID: 9, that is ID: 9a and ID: 9b. To compare the similarities and differences between the rankings of the two job- share teachers, they are graphed together for each child subject (Figure 6.3).

The similarities between teacher perceptions are evident in several categories. Both job-share teachers gave a high – very high ranking in the Intellectual category for ID: 8, whereas the other subject was given a close to high ranking (Often) by one teacher (ID: 9b) and Sometimes by the other (ID: 9a). Both teachers also ranked ID: 9 similarly in the Creative category in the Sometimes- to-Often range, as well as in the Section B category of Socio-emotional difficulties. The main observation to be gained from these trends is that both teachers affirmed strengths in at least one category in Section A and possible difficulties in at least one in the Section B categories.

Whilst there are several similar teacher perceptions there are also clear differences. Unlike the similar ranking for ID: 8 by both teachers in the Intellectual category, subject ID: 9 was ranked Sometimes (4) by one teacher (ID: 9a) and close to Often (5) by the other (ID: 9b). A more pronounced difference was observable for ID: 8 in the Creative category – ranked as Sometimes by ID: 8a, as compared to the other teacher's ranking as Always (6). This marked variation was also evident in Academic difficulties with ID: 9 receiving Not observed to Uncertain (2–3) by job-share Teacher 1 (ID: 9a) and close to Often (4–5) by the other (ID: 9b). There was also what may appear as a completely different perspective between the two teachers in the Muscular category with ID: 8 receiving Not observed by Teacher 1 (ID: 8a) and Often by the other. The other key difference in the graphed results is that job-share Teacher 2 was consistently higher in her rating of ID: 8 and ID: 9, apart from the higher rating by ID: 9a of ID: 9 in the Muscular category. Overall both teachers have reasonably comparable assessments in several categories for each child, but there are evident variations.

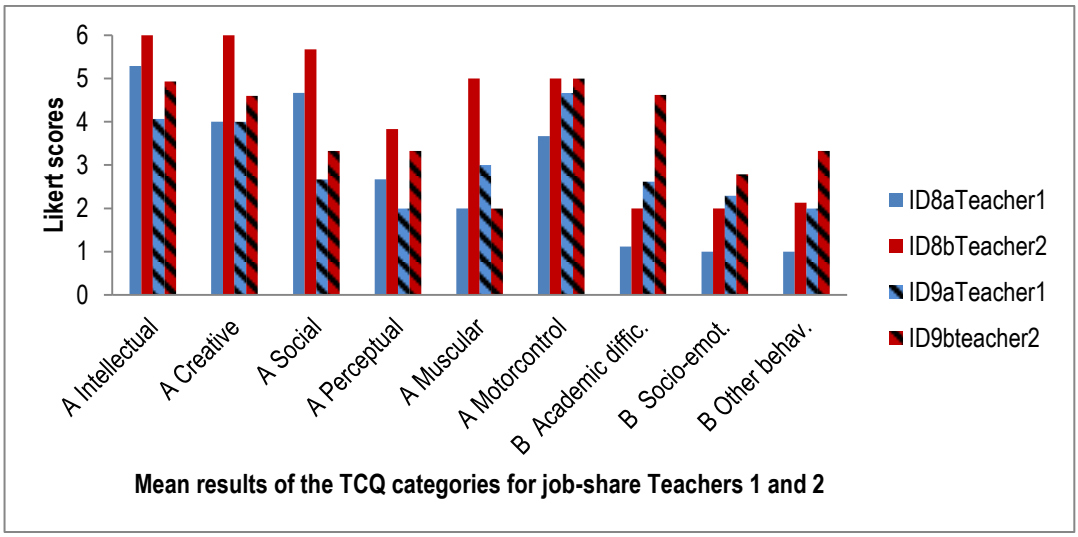

Figure 6.3: Graph of the mean results of the TCQ categories for the two job-share teachers – Teacher 1 and Teacher 2
Note. Job-share Teachers 1 and 2 completed the TCQ for each of the two child participants. The evaluations of job-share Teacher 1 = ID: 8a and ID: 9a and job-share Teacher 2 = ID: 8b and 9b

6.3.3. Teacher reflections about the TCQ

Following the Trial of the TCQ, the teacher participants gave verbal perceptions about its usefulness, which are recorded in Table 6.14. Their reflections are positive and there is a suggestion that for future possible implementation, a prior discussion at a staff meeting about GLD (2e) traits would be helpful, as was the case with the Study. There is also a comment apropos of the best time of the year to apply the Questionnaire and also about the desirability of having a longer time to complete it.

Table 6.14: Teacher reflections about the usefulness of the Checklist

Teacher responses
It would be desirable to have the questionnaire for a longer time so that there is a greater chance of responding to all of the questions with more certainty.
The questionnaire helps teachers to reflect on the whole child and thus enhance understanding.
Having the session at the staff meeting about the possible characteristics of GLD children was really important prior to completing this questionnaire.
A questionnaire like this would be best given towards the end of Term one when teachers were familiar with their children.
It has the possibility of detecting varying ability groups and varying needs
It highlights the differences between GLD children
The Checklist is fascinating but subjective … I want to make sure that I am giving the most accurate and informative data.

6.3.4. Researcher observations

In Table 6.13, it is noted that there was an alteration of two rankings by one teacher participant the day after her completion of the TCQT, mainly in response to receiving results of a standardised test. After viewing the particular child's scores from ACER General Ability Tests (AGAT) (Stephanou et al., 2008a), two rankings in the Intellectual category were changed from Often to Sometimes. At the same time a ranking in the Social category was altered from Often to Sometimes.

6.3.5. Further teacher perceptions – Discussion

The influence of individual teacher perspectives was a dominant feature of this section. A summary of the findings is in Table 6.15.

6.3.5.1. Open responses

The purpose of the open responses section is to provide teachers with the option of recording extra material for their future deliberations and in terms of the Study to ascertain the extra layer of data to gain an appreciation of the value of combining open response options in a quantitative questionnaire. Consequently, data obtained provided more in-depth understanding about the child subjects whose teachers had included written responses. The diverse mixed abilities and learning difficulties of GLD (2e) children require multiple qualitative and quantitative data to gain a clearer understanding of their complex anomalies.

Table 6.15: Further findings about teacher perceptions (summary)

<table>
<tr><td colspan="2">Phase One Question: What are the components of a comprehensive, useful checklist for the preliminary stage of identifying possible gifted children with learning difficulties?</td></tr>
<tr><td colspan="2">Methodology: Mixed Methods Research); Research design: Participatory Action Research
Methods:
C: Data collection –Quantitative and qualitative
C: Data analyses – demographics, internal consistency, group comparisons, other teacher perceptions</td></tr>
<tr><td>Literature review</td><td>Study C: Development of a comprehensive, useful checklist questionnaire
(Further findings about Teacher perceptions)</td></tr>
<tr><td>Conclusions (Section 2.3.5)
Teachers:-

1) lack knowledge of the diverse nature and issues related to GLD (2e) (Wormald, 2011); and

2) standardised tests are not always suitable for GLD (2e) (Nielsen, 2002; Silverman, 2009a) although they are valuable for a comprehensive assessment protocol (Assouline et al., 2010)</td><td>Findings
Job share teachers:-
Checklist optional open responses
1) Observed strengths in a subject/area of interest and personal qualities
2) Noted difficulties in task avoidance, and personal needs
Variations in individual responses for the same subjects
3) Affirmed strengths in at least one category in Section A, and possible difficulties in at least one of the Section B categories.
4) Noted marked variations in assessment of ID 8 in Creative, Muscular, and ID 9 in Academic difficulties
Reflections about the Checklist
5) Positive feedback included having the TCQ for a longer period to use for assessment and that a prior in-service about GLD would be helpful
Teachers
(TPQ – Chapter 5, Section 5.1.3.1, Table 5.5):-
6) Show a correlation in their perceptions / knowledge about 2e children and professional development, and also years of teaching experience
7) Note main strengths in thinking skills, oral language skills, specific subject or area, and creativity</td></tr>
</table>

Note. Adapted from Cornish (2012)

6.3.5.2. Job-share assessments

In any questionnaire, the question of face validity is an important consideration and in the case of the TCQ there was opportunity to explore the impact of differences in individual perceptions due to the fact that two child subjects each had two job-share teachers. These teachers were both from the same class and showed similarity in how they were ranking the two children in the Intellectual, Perceptual and Motor control categories, but there are considerable differences in views in the Creative and Muscular categories. There is also marked difference between the two teachers in their ranking of one of the children's Academic difficulties. The differences were initially surprising, but there were various factors influencing these variations, which remind researchers of the extraneous variables

colouring participant responses. Consequently, findings are interpreted wisely as trends. The amount of teaching time of each job-share teacher was different and they each focused on specific subject areas, which, is likely to have influenced their perceptions, particularly if there was little observation of a number of the category items. For example, the contrasting views of ID: 8's muscular ability is likely to be a result of the fact that only one of the teachers observed part of the weekly sports' lesson. Also one of the teachers has more years of teaching experience, including extra study in gifted education and experience with GLD (2e), which would also have contributed to the mixed views. Interestingly this teacher tended to have higher rankings in most of the Section A and Section B categories. It is recalled that one of the findings of the TCQD in Chapter 5 shown in Table 6.15 (Finding 6) is a correlation between training (pre-service, extra tertiary and professional development) and knowledge of 2e. Individual differences of respondents further support the desirability of a comprehensive assessment protocol, which Assouline & Whiteman (2011) assert also needs to include standardised tests for comparison.

6.3.5.3. Other teacher reflections

Time tabling factors in a busy school do not always allow the researcher the luxury of allowing extra time that would be desirable in collecting explicit data from teacher respondents, but the post trialling reflections proffered were illuminating in terms of the future use of the TCQ. It would be more practicable and logical for a classroom teacher to have access to the questionnaire for a longer period, so that there is greater opportunity to verify judgements about items such as "in-depth level of perception" (Perceptual category) or even whether the child does "grasp concepts all at once" (Intellectual category). It is possible that the findings of the TCQ may have shown variation with a longer time frame for teacher respondents to observe and consider. The other teacher reflection to be acknowledged is that there is an advantage of explaining the nature of GLD (2e) traits at a Staff meeting or specific teacher development session because as noted by one of the participants, preliminary discussion and reflection help the initial investigation.

6.3.5.4. The question of standardised tests

As Assouline & Whiteman (2011) note, the inclusion of standardised tests in the identification of GLD children is advantageous, particularly for comparison to subjective assessments, but the downgrading of one teacher's ranking of two scores in the TCQ

Intellectual category, following news of one of her student's results in AGAT (Stephanou et al., 2008a) raises important considerations. Firstly, as reviewed in Chapter 2, standardised tests, although providing important summative information, do have limitations. No single test can be assumed to be totally reliable and provide completely accurate information (Airasian & Russell, 2008; Black & Wiliam, 2006). Various factors or sources of error can influence test performance (Black & Wiliam, 2006), including the dilemma that there are GLD (2e) children whose test performances are inconsistent (Foley Nicpon, Allmon, Sieck, & Stinson, 2011; Rimm, 2008). The other point that the change of score highlights, is that teachers are unlikely to know the true ability and accompanying learning needs of all children in their class, including any who may be GLD (2e), for multiple reasons. The down grade of the child's score from Often to Sometimes is not substantial but it reminds researchers of the shifting grounds of accuracy.

To summarise this section, the influence of the teacher as an individual in the identification process is significant, which in the Study justified a rigorous approach to develop clear questionnaire items and include staff participation, typical of the reconnaissance phase of the PAR. It would be desirable in future trialling to include a question in the TCQ about respondent impressions of item clarity.

6.4. Teacher Checklist Questionnaire Trial – Summary of Results and Discussion

The results of the preliminary investigation into the TCQ's usefulness are largely affirming both in internal consistency and in correlations between the categories. These findings, together with the comprehensive nature of the categories, including checking for face validity, are fundamental to the tool's validity and reliability. In using Cronbach's α it is evident that most categories are above the level of good internal reliability with two, Perceptual and Motor Control, with lower results. It is noted from the multicollinearity of a number of items that there is scope for further streamlining following replication with larger samples thereby enhancing the efficiency of the TCQ as an assessment tool. Analysis of the correlations between the TCQ categories is supportive of the tool's structure and there are significant and strong correlations in five of the six Section A categories. In the sample, the Muscular category appears to be independent of the other categories, but would require more items before a true interpretation could be made.

The TCQ results show variations in strengths and possible difficulties in the multiple results of individuals and in comparison to their Year level, as well as compared to other subjects in their trialling group. These trends reflect the children's individual ability profile, observable traits and teacher perceptions.

In group comparisons, via both descriptive analysis and the non-parametric Kruskal-Wallis *H* test, Groups 1 and 2 indicate strengths mainly in the Mental abilities of Intellectual, Creative and Social. The follow-up Pairwise comparisons of the categories and calculated effect sizes, confirm that Groups 1 and 2 tend to feature in the Mental categories – mainly in the Intellectual, and Social. In the Section B categories of possible learning difficulties, the groups are significantly different from each other in Academic difficulties, with Groups 2 and 3 ranking significantly higher than Group 1 in the learning difficulties categories of Socio-emotional and Other behaviours. It is emphasised that these analyses are for one sample of children who are not formally identified as being gifted or having learning difficulties.

Further insights regarding the TCQ's practical usefulness are observed in the range of individual teacher responses. The open-responses provide details of teacher perceptions that were not possible in the 6-point scale. Teachers' open responses focus mainly on strengths in particular subject areas and personal qualities. In Section B the most evident theme is personal/confidence needs and particular mannerisms. Individual teacher reflections suggest that there is support for the TCQ but with recommendations of having a longer period for assessment and prior professional development on the typical traits of GLD (2e).

In conclusion, and including the points raised in the discussions, the preliminary analyses of Phase One generally support the TCQ as a potentially useful initial identification assessment tool. It also notes that these findings are based on a sample size of 24 in one school site, but nevertheless indications/trends suggest a strong foundation for future replication. To proffer an answer to this chapter's focus on the components of a useful questionnaire (TCQ) they would include:

- promising indications of scale reliability and validity (based on the rigours of trialling and statistical analysis);
- a number of categories that in terms of the literature about giftedness with LD show significant correlations; and

- capacity to have practical usefulness for primary school teachers.

There is a further question that is required to support the Phase One investigations, which is the focus of the Phase Two Case studies. The following Chapter 7. Phase Two: Case studies – Research Methods, focuses on mixed-methods assessment strategies to determine to what extent one or more of these strategies supports the findings of the TCQ Trial.

Chapter 7. Phase Two: Case studies — Research Methods

> Gifted people with disabilities are heroic. They are to be admired when their compensation attempts work and supported when the mechanisms are inconsistent. Only then will they develop the confidence to fulfill their own unique purpose in the world (Silverman, 2009b, p. 118).

The Case studies, which incorporated mixed methods, focused on investigating the question: *To what extent can the Checklist (TCQ) be supported by other assessment strategies?* The strategies are shown in order of development in Figure 7.1.

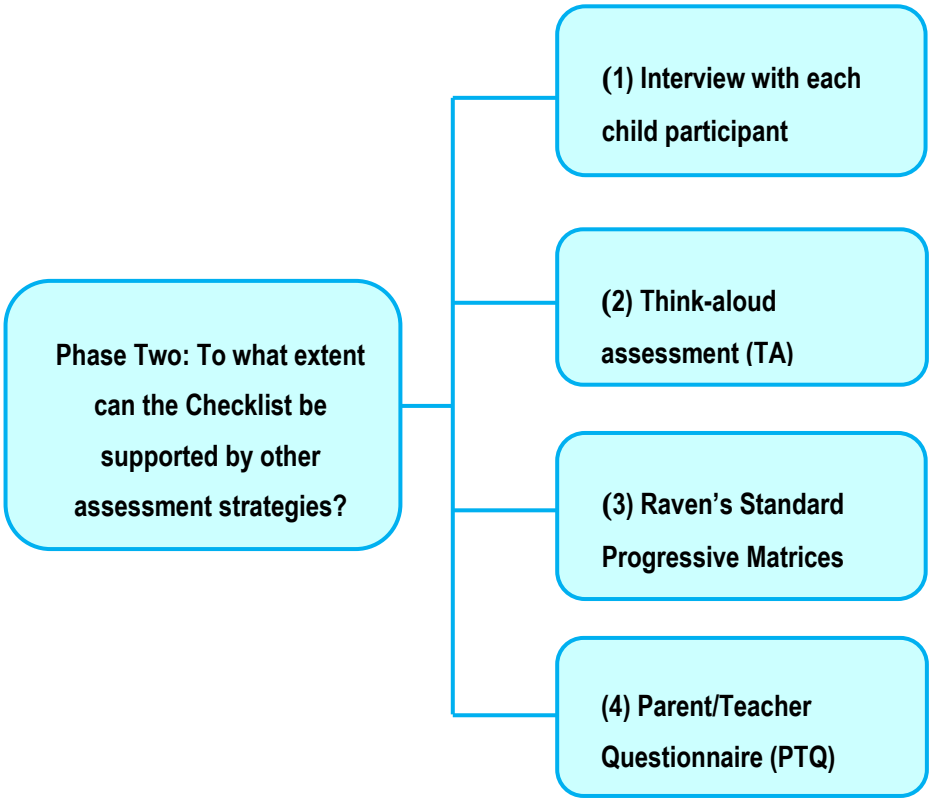

Figure 7.1: Phase Two assessment strategies

The following chapter outlines the methods of data collection and analyses for each of the strategies. Brief explanations of the strategies are included where they enhance comprehension of their methods.

7.1. Selection of Case-study participants

Six children participated in the Case studies. The sampling procedure involved reviewing the findings of the TCQ and noting any children who may indicate strengths and possible learning difficulties. In particular, I sought children where the findings seemed to need more clarification, for example, a possible contradiction between the results from the Intellectual category as compared to very favourable RSPM results. For the Case-study investigations, I also had access to:

1. National Assessment Program: Literacy and Numeracy (NAPLAN) results (Australian Curriculum Assessment and Reporting Authority, 2012);
2. Raven's Standard Progressive Matrices assessments (Raven et al., 2000) from 2010; and
3. ACER General Ability Tests (AGAT) (Stephanou et al., 2008a) – results from earlier years for two students.

In determining possible participants, I consulted with the class teacher of each child. There was agreement for all six children. The other members of the teacher focus-group involved in the Teacher Checklist Questionnaire development (TCQD), were not involved in the selection process for the Case studies. The only other occasion that they were consulted was in reviewing possible recommendations arising from the development and trialling of the TCQ.

The participants were from Groups 2 and 3 of the TCQ Trial, that is, children with either an above-average to high standardised test result but who may be underachieving due to a possible learning difficulty, or those with 'hidden'/uncertain ability. There were two girls who are identical twins and four boys, including two brothers. Four of the children showed some strengths in at least the Intellectual category, but two — Richard (ID: 17) and Christopher (ID: 22), did not feature in this category. (Names used are pseudonyms.) Richard showed strength in the Muscular category, and Christopher's result of Sometimes-to-Often in the Creative category, in combination with noted possible learning difficulties, were the criteria for his selection (Table 7.1).

Table 7.1: Checklist mean rank results from the TCQ for the six Case-study participants

Trialling Group		Section A: Indicators of possible significant learning potential						Section B: indicators of possible learning difficulties		
Child participant number (ID), Year level and age		Mental domains/categories				Physical categories		Academic difficulties	Socio-emotional	Other
		Intellectual	Creative	Social	Perceptual	Muscular	Motor control			
Group 2: High standardised tests and possible LD										
ID: 20 Miriam	(Year 6, 12 years 1 month)	4-5	5 [a]	4-5	3-4	2-3	3	2-3	2-3	2
ID: 24 Skye	(Year 6, 12 years 1 month)	5-6 [a]	5-6 [a]	5-6 [a]	2-3	2	2	2-3	3-4 [b]	2-3
Group 3: 'Hidden'/uncertain ability										
ID: 9a Dominic	(Year 3, 9 years 5 months)	4	4	2-3	2	3	4-5	2-3	2-3	2
ID: 9b Dominic	(Year 3, 9 years 5 months)	5 [a]	4-5	3-4	3-4	2	5	4-5 [b]	2-3	3-4 [b]
ID: 17 Richard	(Year 5, 10 years 8 months)	2-3	2-3	4-5	2-3	6 [a]	2-3	3	2-3	3-4 [b]
ID: 21 Michael	(Year 6, 11 years 9 months)	5 [a]	3-4	4	2-3	2	4	3-4 [b]	3-4 [b]	3-4 [b]
ID: 22 Christopher	(Year 6, 11 years 9 months)	3-4	4-5	3-4	3-4	2	3-4	4-5 [b]	4-5 [b]	4-5 [b]

Note. ID: 9a = evaluation by job-share Teacher 1 of ID: 9, and ID: 9b = job-share Teacher 2; Superscript [a] = possible area of strength; [b] = categories of interest

I was particularly interested to determine whether the mixed-methods Case-study assessment strategies would support or question the TCQ findings. Each parent was informed prior to the Case studies of the types of assessments to be used and their purpose.

7.2. Strategy 1: Interviews with child participants

To start the case-study process, I conducted an interview with each of the six children. As has been noted in the Literature review, listening to self-reports, or the student voice, can provide potentially valuable data (Cook-Sather, 2006). Although children's self-reports can vary in reliability depending on their age and developmental stage (Borgers et al., 2000; Stipek, 1981), there were still insights to be gained about how children perceive their strengths and any areas of academic difficulties.

7.2.1. Method

I devised the questions for the interview starting with general-type questions allowing time for the children to settle and adjust, before moving into more reflective questions. A copy of the interview questions is included in Appendix 28. Each child was interviewed separately for approximately 15 minutes.

7.2.2. Data analysis

The interviews were transcribed from the voice recorder and I used content analysis to code the findings into specific areas/categories shown in Chapter 8, Section 8.1.

7.3. Strategy 2: Think-aloud assessment

The Think-aloud protocol (TA) is an on-line approach that encourages children to verbalise their perceptions after reading selected sentences, or each paragraph of a passage of text. (The passages used and their source are shown in Appendix 29.) It will be recalled from the Literature review that reference to 'on-line', means that the assessment is occurring simultaneously with the task (Saraç & Karakelle, 2012). It is a valuable approach to investigate children's "reading behaviours", reading "cognitive strategies" (Sprainger, Sandral, & Ferrari, 2011, pp. 33-34), as well as use of higher-order thinking skills. The TA assessment can highlight abilities in critical thinking and metacognition,

both of which tend to feature in varying degrees of ability in gifted/high-ability children (Coleman & Shore, 1991). Evidence of these abilities typically manifests in a stronger capacity to reflect, monitor, devise solutions and reason (Coleman & Shore, 1991; Shore & Kanevsky, 1993; Sternberg et al., 2011), which are attributes pivotal to skilled reading (Baker, 2002; Mokhtari & Reichard, 2002).

7.3.1. Participants

All of the six Case-study children were involved as participants in the TA assessment. The site used was always in a room that was accessible to the view of another adult.

7.3.2. Method

Prior to the Think-aloud procedures, I interviewed each child briefly about how they viewed their reading skills (pre-TA interview). The data were tabulated. The TA method went through a process of modification as each child participant and I became more familiar with its purpose and technique. English groups are part of the school site's daily program and the children are accustomed to reciprocal reading/teaching (Palincsar & Brown, 1986), where teacher and children read and discuss pertinent areas under review. However, for the TA to be conducted meaningfully, reciprocal reading needs to be taken to another level. The child is challenged to share not only insights on textual meaning, but to express critical thinking and metacognitive strategies that they may have used to assist and expand understanding. This latter point does occur in effective reciprocal reading situations, but the TA is more probing and challenging and requires the child to attend to all the possible considerations for the entire session, depending on their age, level of concentration, interest and skills.

Table 7.2: Texts used for the Think-Aloud assessments

TCQ ID	Pseudonym	TCQ group	Narrative	Non Fiction
9	Dominic	3	(Stilton, 2013, pp. 106-108) *The Volcano of fire*	(Murray, April 2013, p. 17) *Dogs at War*
17	Richard	3	(O'Brien, July 2013, p. 7) When the lords of earth departed	(Murray, 2013, p.17) *Dogs at War*
21	Michael	3	(Webb, 2001, p. 24) Sailing to Atlantis: The Sinbad Chronicles	(Catchpole, December 2003-January 2004) *The cycle of growth and destruction*
22	Christopher	3	(O'Brien, July 2013, p. 7) When the lords of earth departed	(Catchpole, December 2003-January 2004) *The cycle of growth and destruction*
24	Skye	2	(Webb, 2001, p. 24) Sailing to Atlantis: The Sinbad Chronicles	(Catchpole, December 2003-January 2004) *The cycle of growth and destruction*
20	Miriam	2	(Webb, 2001, p. 24) Sailing to Atlantis: The Sinbad Chronicles	(Catchpole, December 2003-January 2004) *The cycle of growth and destruction*

Note. TCQ ID = Identification number of participant in the Teacher Checklist Questionnaire Trial

A typical TA session involved a period of ensuring that each child participant was comfortable and familiar with the procedure. The page of text for reading was selected at the child's instructional level and set out as separated sentence groups or paragraphs. The instructional level is usually where a child can read approximately 93 to 97% of the words with relative confidence (Treptow, Burns, & McComas, 2007). I also selected both a non-fiction and a narrative text (Table 7.2), which I hoped would be of interest and topical. As the child completed reading and reflecting about each section, another was uncovered. This procedure was important to gain insights into the child's cognitive abilities and the strategies he/she employed, both to make sense of one block of text and to ascertain the links with the entire passage (Klingner, 2004; Schellings et al., 2006).

After a trial run of the TA, I found that it was helpful to the children if I modelled my thoughts and strategies about how I would make sense of a selection of text. A copy of this model appears in Appendix 30. Prior to this modelling, I went through a series of questions that I could consider in my own TA (Table 7.3). These questions were available for the children's referral if required. At times during the TA, I would add a short question to encourage the children to go further in their responses, for example:

- Are there any questions coming into your mind?

- Any comments that you would like to make?
- What do you think this word/phrase means?
- What makes you think that?
- Is there anything more that you would like to add?

Affirmation of the children's efforts was a very necessary component of the process, to allay any anxieties and to enhance a sense of achievement.

Table 7.3: Optional questions to support the Think-aloud process

Possible questions for child participants to consider
What am I noticing?
What am I figuring out about the characters or the story (or factual text)?
What am I predicting might happen next?
Questions that I might ask myself about words that I am unsure of, or about the characters
How can I figure out the meaning, particularly if it is a little unclear?
Is there a picture that comes into my mind?
My opinions

7.3.3. Data analysis

To record the results of the TA, I developed a framework called the Adaptive Think-Aloud Framework (ATAF). There are two sections of the ATAF: i) Section A: Observations of reading skills and related information, and ii) Section B: Assessment of critical-thinking and metacognition. The Framework (Sections A and B) was adapted from the frameworks, models or approaches of a number of contemporary researchers in the field (Bannister-Tyrrell, 2013; Klingner, 2004; Schellings et al., 2006; Whitebread et al., 2009)

The first procedure, one typical of qualitative analysis, was to transcribe the voice recordings and then to commence the process of analysis by completing Section A: Observations of reading skills and related information. A pro forma of the Section A frame is shown in Table 7.4. Copies of the children's Section A results are in Appendix 31. The frame is designed for recording observed phonological, semantic and syntactic skills, any previous diagnoses and other related information, including possible non-verbal responses. Non-verbal responses may, for instance, include evidence of tiredness, or

anxiety, or from a metacognitive view, even pausing for deliberation about the text. Once all the details had been recorded, they were then summarised in Summary of observations of reading skills (Table 7.4, Sub-heading 4).

Table 7.4: ATAF Section A

ATAF Section A: Adaptive Think-aloud assessment for the Case-study participants		
Child participant: Year level: Age: Date:		
Textual passage details: Abbreviations: s/c = self-corrected		
Observations of reading skills		
1. Phonological/semantic/syntactic skills	Observations	Confidence
Decoding		
Word identification		
Fluency — reads at an appropriate speed		
Appropriate intonation		
Observes punctuation		
Tracking	Observations	
Follows direction of text		
Use of tracking aids — finger/aid		
Skips phonemic blends, words or sentences		
Word meanings		
2. Previous assessment of any difficulties that may affect reading skills		
3. Other observations		
4. Summary of observations of reading skills		
Phonological/semantic/syntactic skills		
Decoding, Word identification, Fluency, Intonation, Observes punctuation		
Tracking		
Word meanings		
5. Other information		

This preliminary assessment was important to gain insight into the children's skills in the mechanics of reading. Limitations in this area may impact on expressions of critical thinking and metacognition, and hence this more structural view of reading skills was important for assessing possible GLD (2e) children.

As the overall TA process includes the Section A assessment, as well as the higher-order skills in Section B, the overall framework is called an Adaptive Think-Aloud framework. Section B of the ATAF focuses on the categories associated with critical thinking and metacognition. The advantage of using the complete ATAF format is that children who may not excel in standardised or class tests and/or show some difficulties in the mechanics of reading, or may receive rankings in the TCQ which may suggest relevant academic difficulties, may still reveal critical thinking and metacognitive abilities.

Table 7.5: Indicators and characteristics of critical thinking and metacognition

Indicators and characteristics of critical thinking and metacognition	
Indicators used in assessment of critical-thinking skills in reading comprehension	**Examples of observations of critical thinking**
1) Clarifies	Queries/questions for clarification
2) Infers	Deduces meaning from experience or existing knowledge
3) Analyses	Identifies and analyses the plot
4) Makes connections	Refers to other related sources or the text to enhance meaning
5) Monitors	Reviews strategies used
6) Evaluates	Evaluates own responses
7) Questions	Challenges any assumptions
8) Creates a solution/devises resolution	Attempts to solve or resolve
Indicators of metacognition (Tarricone, 2011)	**Examples of observations**
Knowledge of cognition (implicit or explicit):	
Declarative reasoning	Indicates what is known/unknown and/or what needs to be known (Tarricone, 2011)
Procedural knowledge	Indicates the procedural strategy used
Conditional – when, where, why	Shows awareness of when/where to use declarative reasoning and/or procedural knowledge (Schunk, 2012)
Regulation of cognition/ Self-regulation:	
Regulation	Monitors, plans, checks, self-corrects
Metacognitive experience	Expresses feelings of familiarity or confidence (Efklides, 2006); Judges/evaluates "own thinking processes, capacities and limitations" (Wilson & Wing Jan, 2008, p. 5)

The indicators selected for the critical-thinking and metacognition sections of Section B are shown in Table 7.5. The critical-thinking indicators, Clarifies, Infers, Analyses, Makes connections, Monitors, Evaluates and Questions have been mainly drawn from the works of Ennis (2013), Halpern (2007), Paul and Binker (1990), Sternberg (1986), and Tarricone

(2011). The indicator Solves/Resolves is adapted from Shore and Kanevsky (1993). Table 7.5 also outlines characteristic observations or features of the indicators.

To assess the child participants' critical-thinking skills, their responses were recorded in the ATAF Section B under Samples from Think Aloud next to the relevant critical-thinking indicators (Table 7.6). The types of observations connected to these indicators were listed under Types of skills observed, for example, clarifies, deduces. Instances of cross-coding in any of the numbered indicators appear in red text prefixed by the letters c/c as shown in Appendix 32. The term 'cross code' refers to a common practice in qualitative research where a response may be linked to one or more a priori categories in the assessment frame.

The Section B frame also includes Indicators of metacognition. Using Tarricone's Taxonomy of metacognition (2011), I included the two core-components, Knowledge of Cognition and Regulation of Cognition. As noted in the Literature review Figure 2.2 and illustrated in Table 7.6, Knowledge of Cognition encompasses the super-categories of i) Declarative knowledge, ii) Procedural knowledge and iii) Conditional knowledge (Tarricone, 2011). In Regulation of Cognition are the super-categories of i) Regulation or metacognitive skills and ii) Metacognitive Experiences. These super-categories are henceforth collectively referred to as metacognitive indicators. Examples of TA observations related to these super-categories are shown in Table 7.6.

In the Section B frame there is also reference to other key traits that can suggest metacognitive thinking. Under the super-category of Knowledge of cognition is metalanguage, and for super-category Regulation of Cognition are modality, self-talk, pauses and non-verbal responses (Bannister-Tyrrell et al. 2014; Whitebread, 2009). A review of the relevance of these traits to observations of metacognition is found in the Literature review, Section 2.7.4.3. It will be observed in Table 7.6 that the 'Note' section provides information for interpreting the data.

Table 7.6: Sample of Adaptive Think-Aloud Framework (ATAF) Section B Assessment of critical thinking and metacognitive strategies

Critical-thinking skills/indicators			**Indicators of metacognition**				
Skills	**Types of skills observed** e.g., judges, deduces, identifies, analyses	**Samples from Think Aloud**	**Knowledge of cognition**			**Regulation of cognition**	
			D	P	C	R	E
Clarifies							
Infers	1. Deduces meaning of downdraught which was read as "downdrort"	1. I guess 'downdrort' is the **wind that comes off its wings**. The wind whipped up little hurricanes – the downdrort of its wings. The wind fits (…) the downdrort of its wings. If you put wind (…). Hmm it's a bird not a dragon.	√			√	√
	2 .Deduces size of bird	3. The rukh is a **massive bird**. I can tell that. Hopefully the rukh might actually be a dragon. Every feather was the size of a palm frond (read quickly and softly to himself) and a palm is massive. Yes because the feather which would have been massive.	√			√	√
Analyses							
Makes connections							
Monitors							
Evaluates							
Questions							
Solves or resolves							
Other possible reflections of metacognitive thinking			Metalanguage			M P S/t	

Note**.** Abbreviations: D = Declarative reasoning; P = Procedural strategies; C = Conditional; R = Regulation of cognition; E = Metacognitive experiences (refer to Table 7.5 for examples)

Knowledge of cognition (explicit/implied), e.g., references to cognitions including what is known and not known; metalanguage;

Regulation of cognition includes monitoring reflection, self-correction and evaluation; modal words, pauses or non-verbalisations;

Observations highlighted: **Green** = expressions of metacognitive knowledge and/or regulation of cognition; **Black** = metalanguage; **Blue** = modal words; **Purple** = pauses or non-verbal utterances or other mannerisms and **Yellow** = self-talk (ATAF adapted from Bannister-Tyrrell, 2013; Klingner, 2004; Schellings et al., 2006; Tarricone, 2011; and Whitebread et al., 2009)

In the Section B frames in Appendix 32, reference is made to 'Links – experience', which means that the child links his/her views to prior experience /knowledge and 'Links – text' meaning, as it suggests, bases perceptions on the text being read. It is also important to clarify that for noting examples of metalanguage, direct repetition of words already

referred to in the text is only included where they are part of an explanation or other cognitive reference.

Scoring the results from the ATAF involved two different procedures. In Section A, a summary was included for each child in the Summary of observations of reading skills. For Section B the total number of observations in each critical-thinking indicator, and in each subcomponent of Knowledge of Cognition and Regulation of Cognition, were tabulated. The raw scores were then divided by the number of each child's responses to obtain a score out of 100 for comparison purposes (Appendix 33). These results were tabulated under each of the Section B indicators to show instances of the children's explicit usage of Critical thinking skills and metacognitive strategies (Appendix 34).

7.4. Strategy 3: Raven's Standard Progressive Matrices (RSPM)

A general intelligence test, the non-verbal Raven's Standard Progressive Matrices (RSPM) (Raven, Raven & Court, 2000) was incorporated as a standardised-assessment strategy. It is a non-verbal test of reasoning ability and fluid intelligence (Geake, 2009), and I felt its visual format was ideal for the Case-study children, a number of whom appeared to have some reading difficulties. A review of the advantages and limitations of RSPM are in the Literature review, Section 2.7.2. I felt that as the RSPM had already been administered to most of the Case-study children in 2010, there would be value in comparing these earlier results to the current findings.

The RSPM test consists of a series of puzzles, progressively becoming more intricate with each puzzle requiring the respondent to select a missing piece from six options in Sets A and B and from eight options in Sets C to E. The purpose of using RSPM was to obtain a clearer understanding, within the limitations of any test, of each child participant's possible cognitive ability, particularly in relation to his/her capacity to utilise higher-order problem-solving skills as the puzzles became progressively more difficult (Raven et al., 2000) .

7.4.1. Method

The test was administered to the children at the same time, in a quiet location following the recommended RSPM guidelines. Two of the Case-study child participants were absent so they were given the test at a later date.

7.4.2. Data analysis

The RSPM Score Key was used to determine the children's percentile rankings. The Manual ranks the percentiles as:

- (a) the 95th percentile or above, being "Intellectually superior";
- (b) the 75th percentile as "Definitely above the average in intellectual capacity";
- (c) the 25th to the 75th percentile as "Intellectually average";
- (d) the 25th percentile or below as "Definitely below average in intellectual capacity" and
- (e) the 5th percentile or below as "Intellectually impaired" (Raven et al., 2000, p. 69).

I tabulated the children's raw scores and percentile rankings, together with the results from any previous RSPM or ACER General Ability Tests (AGAT) (Stephanou et al., 2008a). These results are shown in Chapter 9, Section 9.1.1.

7.5. Strategy 4: Parent/Teacher Questionnaire (PTQ)

The main purpose of using the Parent/Teacher Questionnaire was to compare the parent/s' and class teacher's perceptions of each child's capacities. There was an extra questionnaire that was completed for the child participant in Year 3 because he had two job-share teachers. Because the Case studies are not comparing groups of children's results, which ideally would require that each child is scored independently by one teacher, the perceptions of both job-share teachers are included in all of the analyses.

The category headings for the PTQ were adapted from assessment categories used by Rogers (2012), for identifying Specific Learning Difficulties (SLD) in gifted children. These areas of focus are included in documentation of procedures and results used in a major project, Project 2Excel (Rogers, 2012) which was conducted in the state of

Minnesota, United States of America between 2009 and 2012. The categories consist of Gifted potential, Cognitive style, Academic achievement, and Interpersonal and Intrapersonal relationships. I used the category heading Cognitive style as well as Interpersonal and Intrapersonal. Instead of Gifted potential, I felt that it was more appropriate to use Potential, because including the term 'gifted' in a parent/teacher questionnaire could lead to premature assumptions. I also used the category Achievement rather than the term Academic achievement as it was more conducive to the items being assessed. Within each of the Rogers' SLD categories/areas of focus, are a number of typical GLD (2e) characteristics, some of which I have incorporated, particularly where validated through research, and or by multiple anecdotal references. The source of these and all other items selected is indicated in the copy of the PTQ – Appendix 35. As with the TCQ, choice of wording was important and rather than an item specifying "Experiences high levels of anxiety and depression" (Rogers, 2012), I used "Can experience anxiousness", which I considered was more suitable, particularly for parental assessment.

In the PTQ, there are a number of items which are deliberately similar, or identical to those found in the Intellectual category of the TCQ. Table 7.7 shows a sample of these similar or identical items in both the Intellectual category of the TCQ and the Potential sub-scale of the PTQ. Aligning items in this way allows the option in possible future trialling with larger samples of determining whether teacher perceptions were consistent, realising of course that the two rating-scale questionnaires are different. Preliminary investigations (graphs) are included in Appendix 36, and will be referred to in the recommendation section of Chapter 10.

It was important to have the two separate rating-scales. The TCQ is designed for teacher usage and the purpose of the PTQ was to gain a perspective on a range of relevant questions to build on the understanding of each child participant's capacities and needs. The PTQ was also designed to draw attention to the need for educators to listen to the voice of parents in the assessment protocol for identifying possible GLD (2e) children.

There was an opportunity for parents (and teachers) to record any information in the open-ended sections of the PTQ. To ensure confidentiality, the responses were summarised and cross-checked by a teacher not involved in the Case studies. Coding the open response data was not feasible owing to both the small number and range of responses.

Table 7.7: Comparison of Intellectual category items (TCQ) to Potential items (PTQ)

Checklist	Parent/Teacher questionnaire	Comparison	
Intellectual	**Potential**	**Identical**	**Relevant**
Learns new concepts quickly and easily	Learns new concepts very easily	√	
Shows very high ability/skill in one or more areas	Has a high level of talent in at least one area	√	
Reveals an in-depth knowledge of an area of high interest	Has an in-depth knowledge of an area of high interest	√	
Extensive and advanced vocabulary	Has verbal communication skills beyond his/her years	√	
Excels at tasks requiring abstract thinking and problem solving	Has strong reasoning and problem solving skills		√
In-depth and challenging questions	Asks in-depth and challenging questions	√	

7.5.1. Participants

The participants were the teacher/s and one parent of each of the six child participants. The PTQ assessment involved five class teachers who had been participants in the Trial of the TCQ. There were two Year 6 teachers, with one completing the TCQ for three of her selected students and the other, one student. The Year 5 teacher completed one questionnaire for one of her students and the Year 3 job-share teachers each rated one student from their class.

7.5.2. Method

The PTQ and a brief explanation of its usage were given to each child participant's teacher(s). The parent of each child received the Questionnaire with a letter inviting his/her participation and advising of my availability if any procedural assistance were required.

The responses to the PTQ were measured in millimetres on a 10-centimetre line and the items were given coded titles and, together with the results, entered into IBM Statistics Package for the Social Sciences (SPSS, Version 23). Microsoft Excel was also used for the output of the statistics. I sought data that would compare the parent and teacher perspectives, (including the two job-share teachers) and give an indication of the internal reliability of the PTQ noting that the results were from the first trialling and using a fairly small sample size.

Prior to the data being coded for SPSS, I reverse-scored a number of the negatively worded items in four of the five categories of the PTQ to match their underlying construct. This process is important for checking internal reliability.

Table 7.8: TPQ foci and item reversals

TPQ sub-scales	Focus	Items reverse scored
Potential	Positive	Nil
Cognitive style	Positive/neutral	6
Achievement	Deficit	2
Interpersonal	Neutral	2
Intrapersonal	Neutral in terms of typical GLD	1

The four constructs involved are Cognitive style, Achievement, Interpersonal and Intrapersonal. In Cognitive style, for instance, the construct is encompassing attributes that are more likely to support learning so for all the items to reflect this construct; six of the items were reversed. For example, the second item "Grasps the big picture instead of learning step by step" can be a strength of gifted children (Hoh, 2003) but the first item, "Prefers to learn step by step" has been reversed because this may not fit in with the construct. In the Achievement sub-scale, I was exploring possible needs, hence two items "Shows proficient computer skills" and "Explains his/her ideas clearly" were reverse-scored. In Appendix 35 it can be seen that there were also two items reversed in the Interpersonal subscale and one in Intrapersonal relationships. Overall, the constructs in the PTQ have a positive or neutral, or possible deficit focus (Table 7.8). In the related graphed data in Chapter 9, Section 9.2.3, the letter R next to any items noted in the 'Note' section indicates that the wording reflects the reversal.

Having a combination of positively and negatively worded items has been used extensively in questionnaires to minimise the various response biases such as acquiescence bias. Items that are worded positively are those that are geared in the same direction as the construct being measured, and respondent agreement results in a higher rating (Lounsbury, Gibson, & Saudargas, 2006). So in effect, if the individual being rated is seen by the respondent to really reflect the construct then a positively worded item would evoke a positive response (Weems, Onwuegbuzie, & Collins, 2006). There are mixed views in the literature about the reliability of including positively and negatively worded items. Some are in agreement (Barnette, 2000; Nardi, 2006) but a greater number

express reservation regarding the problem of respondent confusion and the subsequent impact on the reliability of the questionnaire (Roszkowski & Soven, 2010; Sauro & Lewis, 2011; Schriesheim & Eisenbach, 1995). It is important to note, however, that I did not construct the questionnaire from the perspective of positive and negative wording; rather the focus was on the wording being as comprehensible as possible for both parents and teachers. I was more concerned with face validity. The positive/negative adjustments were for the analysis phase.

7.5.3. Exploring the reliability and functionality of the PTQ

I used Cronbach's alpha (Cronbach's α) to examine the internal reliability or consistency of each of the sub-scales in the PTQ for the parent group, as well as for the teachers. It was not practical to find the Cronbach's α for the entire questionnaire because each sub-scale measures a different construct.

To obtain a general idea of the functionality of the PTQ, I graphed the overall mean scores of parent and teacher responses for each of the five sub-scales (Appendix 37). (Results for the two job-share teachers were included in the first graph for child participant ID: 9 (Dominic).) I used an approach referred to as "Inference by eye" (Cumming & Finch, 2005, p. 170), which involved exploring the visual patterns of parent and teacher perceptions of strengths and possible learning difficulties.

7.6. Summary of research methods for the Case studies

For the Case studies of Phase Two, this chapter has covered methods of data collection and analyses used for assessment of six children selected from the trialling of the TCQ. One strategy included i) an interview with each child at the beginning of the Case-study phase to determine interests and self-report on mainly academic strengths and needs. Other assessments included ii) a Think- aloud assessment (including a pre-TA interview and assessment of reading mechanics and behaviours), iii) the non-verbal intelligence test, RSPM and iv) the PTQ. The questions for the Interviews and the PTQ and TA were developed specifically for the Study. Besides the promise of valuable data to address the question of Phase Two, it was also hoped that the combined strategies may lead to justification for a comprehensive assessment protocol for the initial stage of identifying GLD (2e) children.

The following two chapters include results and discussion for each of the strategies as follows:

Chapter 8 Phase Two: Case studies – Strategy 1 Participant interviews, and Strategy 2 Think-aloud assessment – Results and Discussion

Chapter 9 Phase Two: Case studies – Strategy 3 Non-verbal intelligence test Raven's Standard Progressive Matrices (RSPM), and Strategy 4 Parent/Teacher Questionnaire (PTQ) – Results and Discussion

Chapter 8. Phase Two: Case studies (Participant interviews and Think-aloud assessment) — Results and Discussion

> Most people who will attain success in their lives, however defined, are people who figure out who they are —what they have to offer themselves, others, and the world at large. They find ways of making the most of their diverse talents, and they find ways to lie with their weaknesses. Robert Sternberg (1997, p. 9, cited in Renzulli, 2002)

Phase Two, operating through a case-study approach, sought to determine if other strategies would support the findings of the Teacher Checklist questionnaire (TCQ). The key question is: *To what extent can the Checklist be supported by other assessment strategies?* The results for the first two assessment strategies are presented in this chapter — Strategy 1 Interviews with child participants and Strategy 2 Think-aloud assessments. The results of the shorter interview prior to the Think-alouds (pre-TA interview) are also included. The results of each strategy are followed by discussion in relation to addressing the key question, which includes tabulated Literature review conclusions and relevant study findings (adapted from Cornish, 2012). Limitations are outlined in Chapter 10.

8.1. Strategy 1: Interviews with the participants

The Case studies commenced with interviewing each participant, mainly seeking self-report about interests, aspirations and any perceived learning needs. The data from the interviews were coded into specified a priori categories based on the questions in Appendix 28. Of particular relevance to the investigation were the insights shared about Choice of study, Academic self-report, Areas requiring more skill, Ease of concentration and Ease of remembering (Table 8.1).

For their choice of study, the six child participants all focused on an area that was either an extension of what is available in school, or not readily accessible, for example, still using their Identification numbers from the TCQ trial, Skye (ID: 24) expressed an interest in studying chemistry, and Miriam (ID: 20), composing musical compositions. In Academic self-report, the four Year 6 participants, whilst expressing levels of satisfaction, also specified areas that they would like to improve; for example, Michael (ID: 21) spoke of

the need to complete tasks more expeditiously and the identical twins Skye and Miriam both specified that they would like to achieve higher results, mainly in standardised tests. Furthermore, in the category Areas requiring more skill, four participants indicated specific needs in English, such as reading comprehension and/or handwriting and presentation. Responses about Ease of concentration vary and include, i) being distractible, ii) depends on level of interest, iii) having selective hearing and iv) having great difficulty in concentrating. For Ease of remembering, the results of particular interest were:

- Miriam (ID: 20) having a strong memory owing to being an instrumentalist; and
- Dominic (ID: 9), Michael (ID: 21) and Christopher (ID: 22), indicating some reservations about remembering instructions, mainly if they are longer or have to be remembered over an extended period of time.

As far as could be judged at the time, the children's comments appeared to be a frank representation of their self-perceptions.

Table 8.1: Case study interviews with the six children

ID number and child	School Highlights	Hobbies	Exciting experiences	Choice of study	Academic self-report	Best achievements	Areas needing more skill	Ease of concentration	Ease of Remembering	Reading enjoyment
ID: 9 Dominic	Maths; fun activities; socialising at recess and lunch	Soccer and pet lizard	Fun rides at places like 'Wet and Wild'	Ancient treasures; division; spelling and writing	Pleased with progress in 'time', and likes drama and sport	Lego creations	More skill in time; reading and neatness of writing	Pretty easy; likes to have fun in class with desk partner	Remembers shorter instructions but not long ones	Likes reading a lot and prefers story books
ID: 17 Richard	Group work; sport	Sport at school and out of school	When something has been done well; scoring runs	HSIE; PDH; researching lives of notable individuals	Reasonable	State swimming; fun with friends	Maths; some English e.g., comprehension	Yes but sometimes mind wanders	Remembers instructions	Depends on book
ID: 21 Michael	Handwriting and spelling	Sport and playing with sibling	Books, especially on history	History	Could improve, particularly completing tasks more quickly	Sporting achievement	Focusing	Depends on subject	Depends on the length of the instructions	Passionate
ID: 22 Christopher	Computers; sport	Computer games; TV; playing with sibling	Friends; new video games and new technology	Technology	Reasonable, but could improve in English	Sporting achievement	English particularly spelling	Yes but can be distracted by friends	Difficulty with longer instructions mainly when pre-occupied	Enjoys some books
ID: 24 Skye	Library; projects; free choice	Playing musical instrument; gymnastics; reading	Series of books	Chemistry because it leads to cures and is fulfilling	Satisfied but would like to achieve higher results in ICAS	High achievement in instrumental performance	Handwriting; art; presentation of work	Sometimes in another world – selective hearing	Remembers when there is a desire to do so	Passionate
ID: 20 Miriam	Socialising before school; maths; music	Playing an instrument; gymnastics; interacting with sibling	Music results	Maths and composing in music	Reasonably satisfied but goal is to achieve higher results	Public speaking; high result in instrumental achievement	Reading comprehension	Very difficult, which explains varying results in school tests; Pleased with improvement	Very easy to remember because of the instrumental playing	Enjoys reading but deciphering is a slow process; prefers quicker input from the TV

Note. ID = Identification number for each case study child participant taken from the trial of the Teacher Checklist Questionnaire; HSIE = subject Human Society and its Environment; PDH = Personal Development and Health; ICAS = International Competitions Assessment for Schools (Educational Assessment Australia (EAA), 2017)

8.1.1. Strategy 1: Interviews — Discussion

The purpose of the interviews was to discern the children's self-report as a basis for comparison with the findings of the TCQ and later the other Case-study strategies. The main findings of the first main interview together with the key Literature review conclusions are tabulated as a reference for the following discussion (Table 8.2). (The shorter pre-TA interview details are included in Section 8.3.)

Table 8.2: Summary of Interview findings and Literature review conclusions

<table>
<tr><td colspan="2">Phase Two Question: To what extent can the Checklist be supported by other assessment strategies?</td></tr>
<tr><td colspan="2">Methodology: MMR Research design: Case studies - Strategy one: Interviews with child participants
A: Data collection: Qualitative
A: Data analyses – Content analysis</td></tr>
<tr><td>Literature review</td><td>Study Interview with child participants</td></tr>
<tr><td>Conclusions (Section 2.7.1)
Students' self-report:-
1) can provide insights about strengths and perceived learning difficulties (Cook-Sather, Winter, 2006);
2) can lead to improved pedagogical practice (Rodgers, 2006; Schultz, 2003);
3) is a time-consuming process (Veenman, 2011); and
4) can vary in reliability depending on age and developmental stage of the student (Borgers, 2000; Stipek, 1981).</td><td>Findings
Child participants' views varied and included:-
1) achievements — sport, construction activities, music results, public speaking and socialising;
2) academic performance — satisfaction and also identified areas of desired improvement, e.g., reading comprehension, completing tasks, higher results in standardised tests;
3) desired study — included history, chemistry, mathematics and musical composition;
4) areas requiring more skill — English (spelling and reading comprehension) and handwriting/presentation;
5) ease of concentration — fine or varies e.g., distractible or very difficult;
6) ease of remembering — challenges with longer instructions but one finds it very easy due to instrumental work; and
7) reading — most enjoy; one child indicated slow process of reading.</td></tr>
</table>

Note. (Adapted from Cornish, 2012)

The participants' self-report confirmed Literature Review Conclusion 1 (LRC 1) that valuable insights can be gained in listening to the student voice (Cook-Sather, 2006). This observation was noted particularly by the insight of one participant, Miriam (ID: 20), with her possible visual processing issues negatively affecting the reading process but in contrast, her increased ease of remembering. She explained her difficulty in deciphering words that appeared as a mix of letters. Her identified strength in memory may suggest a compensatory strategy (Silverman, 2009b). In the open responses of the TCQ Miriam's

teacher, indicated uncertainty about her student having any difficulties in reading mechanics, but sometimes noted issues with reading comprehension and that she will question the logic of answers. A further observation was the comment by Christopher (ID: 22) of his difficulty recalling longer instructions, particularly if he was pre-occupied. This limitation was not noted in the TCQ, but subject to his accuracy, would warrant further review.

Although the student voice strategy has merit, it is important to consider LRC 4, which draws attention to the accuracy of the student voice being influenced by the participant's age and developmental stage (Borgers et al., 2000; Stipek, 1981). The children in the Case studies were aged between 9 and 12 years and were more likely to give a truer picture than very young children. However, a reminder of the need to not over-interpret the voice of even older students, without verification, is highlighted by Michael (ID: 20) who waxed eloquently about his enjoyment of handwriting and spelling — a perception which was not shared by his classroom teacher. Perhaps Michael genuinely enjoyed these areas, but he may also have been endeavouring to give a favourable impression.

Another consideration with the interview procedure, is the possibility of children feeling reticent about giving a self-report, thereby not giving a complete perspective of their views. One child participant who has a more reserved manner was not inclined to give detailed responses. A factor that may have influenced his reticence is that he has experienced a number of medical assessment situations and could have experienced subsequent test shyness (Crozier & Hostettler, 2003) or weariness. Furthermore, he was the only participant from his Year level which may also have been a contributing factor. The interviews, although time-consuming for teachers (LRC 3) (Veenman, 2011) are useful as a strategy to support the findings of the TCQ in terms of confirmation and, importantly, in adding a further layer of understanding about the children's strengths and possible LD. However, whilst the results, particularly in terms of the children's specific interests and possible learning difficulties, may reflect 2e and could lead to improved pedagogy (LRC 2) (Rodgers, 2006; Schultz, 2003), it would be folly to make any conclusive assumptions.

8.2. Strategy 2: Think-Aloud assessments

To gain insight into metacognitive strategies and critical-thinking skills in verbal reading comprehension the participants were also involved in TA assessments. Prior to the TA

there was a brief interview (pre-TA interview) with each child, mainly to determine perceptions about their reading skills (Table 8.3). The data from the TA protocol were coded into two assessment frames, Section A: Observations of reading skills and related information and Section B: Assessment of critical-thinking and metacognitive skills.

8.2.1. Children's self-report on reading ability

Although, as noted above, the reliability of self-reports can vary, the children's pre-TA interview comments tend to be consistent with their responses in the first assessment strategy "Interviews with the participants" (Table 8.1). As shown in Table 8.3, all of the children expressed some reservation about understanding text. This observation was also noted in the first interview (Strategy 1), where three of the children, Dominic (ID: 9), Richard (ID: 17) and Miriam (ID: 20), specifically identified reading/comprehension as being an area requiring more skill. Dominic added more to this information when he commented that it was difficult remembering what he had read. Four of the children, Dominic (ID: 9), Michael (ID: 21), Christopher (ID: 22) and Miriam (ID: 20) experienced difficulties in deciphering unfamiliar words. Miriam, in particular, reported again the difficulty associated with lack of word clarity, either through words becoming one word, or appearing "fuzzy". Dominic and Christopher also expressed concern about their slow speed of reading. Michael's response about challenges with decoding and meaning was surprising, judging by his ease of reading aloud, but he may be referring to more abstract historical texts which are his keen interest. Skye (ID: 24) did not identify any specific needs in her reading, other than to report that previous tracking difficulties have improved because of her immersion in the reading of mainly narratives.

Table 8.3: Case study children's self-report about reading ability

Child participant	Sounding out new words	Understanding text	Reading ability	Benefits of reading	Any challenges	Strategies to help understanding
ID: 9 Dominic	Not confident; likely to make errors	Spoke about not remembering much of what is read	Reasonable ability but would like to read faster and be able to read "bigger and harder" words	Future job; acquire information	Tricky words	Reads everything to understand then sometimes re-reads
ID: 17 Richard	Learnt sounding out skills	Mostly	Reading could be better; difficulty understanding some words because not sure of meaning	Helps learning	Remembering what is read depends on whether the text is interesting	Can work out the meaning of some words by reading ahead which was also seen as a benefit of reading; re-reads
ID: 21 Michael	Very confident	Varies according to which part of the original text is read	Really confident	Improves knowledge of vocabulary; becomes part of the story	Decoding and understanding the meaning of harder words	Re-reads
ID: 22 Christopher	Not sure, just has a go	Mostly	Reasonable but not as fast as others	Teaches new words; helps learning and improves speed of reading	Speed of reading and meaning of some hard words; sometimes skips or repeats a line	Re-reads and will check the meaning of a harder word with a parent
ID: 24 Skye	Very confident	Understands well mostly	Hard to compare her ability with others so not completely sure	Form of escape and identifies with characters	Experienced tracking issues which have improved due to prolific reading; still takes longer time to read books	Re-reads
ID: 20 Miriam	Very confident	Hard to understand when reading slowly which is exacerbated when tired	Average but was below average because of line skipping; read more slowly than others but understood it all	School work; helps faster reading; everything benefits	The words are sometimes like one word, sometimes fuzzy and sometimes difficult to read	Reads more slowly and re-reads to connect with meaning; works out new words from context or checks a dictionary

8.2.2. Adaptive Think-Aloud Framework (ATAF) Section A: Observations of reading skills and related information

Results from the ATAF (Section A: Observations of reading skills and other information) tend to support the children's own perceptions of their reading abilities. Appendix 31 has copies of the completed ATAF Section A for all participants. Dominic and Richard both sounded out a number of words and also misread and usually self-corrected more technical terms in the passages. It can be seen in Dominic's ATAF Section A in Appendix 34, that, at times, he also omitted a letter or a blend, for example, instead of "I realised something" he read "*I re, someing".* Michael, who speaks fluent Spanish and has been in Australia for three years, read confidently and made several errors which seemed to be influenced by a combination of i) not knowing the pronunciation of words such as 'downdraught' and 'effortlessly', ii) his quick speed of reading and iii) predicting the flow of the text. Christopher showed results that were consistent with his self-report. His reading was slowed by anxiously making sure that he was reading a number of words correctly by sounding them out. Skye, as expected from her comments in the interviews, read confidently, but hesitated over a number of the more technical words, most of which she did not sound out, but rather misread and usually self-corrected I suspect by listening to the context of the passage. The results for Miriam also supported her self-report. She was particularly anxious to read well, which saw her being very precise about how she articulated the words. There were a number of words that she misread, about half of which she self-corrected, and there was also hesitancy in reading more technical words. This pattern reflected her comment about both the words not appearing clearly on the page (Table 8.3) and also her anxiousness to reach the high standard that she expects of herself (Table 8.1). It is important to note that as the textual passages were at the children's instructional level, it was understandable that there were some words that were more challenging and perhaps unfamiliar. Explanation of 'instructional level' is in Section 7.3.2.

8.2.3. Adaptive Think-Aloud Framework (ATAF) Section B: Assessment for critical-thinking and metacognitive skills

The ATAF Section B: Assessment for critical thinking and metacognitive skills revealed insights about the children's metacognitive capacity and critical-thinking skills in interpreting two passages of written text — narrative and non-fiction. The Section B frames, consisting of the analysed data for all child participants, as indicated in the

previous chapter are found in Appendix 32. A sample has been taken from these frames for each child to illustrate observations of critical-thinking and metacognitive ability (Tables 8.4 to 8.9). It was noted in Chapter 7 (Section 7.5.3) that the Section B frame includes sections for noting any of eight critical-thinking indicators and then the types of observations related to these indicators. For example, the critical-thinking indicator of Makes Connections could include reference to existing knowledge and/or to the textual passage being read. The middle section of the frame includes the child's response to a particular part of the text. Appendix 29 has the textual passages which are deliberately spaced into sections, with each space representing an opportunity for the child to articulate thoughts/strategies arising from the comprehension process. The Section B framework also includes columns to note any indicators of metacognition. As noted in Chapter 7, Section 7.3.3, for observations of metacognition I used colour coding and/or bold text, which is explained in the 'Note' section of each of the samples in Tables 8.4 to 8.9. As well as ticking whether the response may indicate one or more indicators of metacognition, I highlighted in the Note section possible traits of these indicators. For example, if there is an instance of a child referring to, or expanding on what is known (or not known), I highlighted 'references to cognition' in green. Modal words are highlighted in blue. An illustration of the use of modal words is seen in Table 8.5, where Richard (ID: 17) reflecting on the meaning of the word 'protest', comments that he is "pretty sure" that it means fight against, in relation to his thinking that there are protestations in parliamentary deliberations.

Appendix 33 has a table of the total scores of articulated critical-thinking skills and metacognition that have been converted to a score out of 100. These results are included in Appendix 34 and Table 8.10, and represent the instances that the characteristics/indicators were noted in the number of observations for each child. For instance, one child received the score .45 for Infers, which means that this skill was evident in just under half of his critical-thinking responses. For a broader category such as Knowledge of cognition the score out of 100 for each child indicates how often this strategy was noted. For example, evidence of this strategy being utilised in all responses is scored at 1.0. It will be observed that Table 8.10 is included later in this chapter for narrative relevance but retained as Appendix 34.

Results for Dominic (ID: 9) (Table 8.4)

From the results recorded in Section B of the ATAF (Appendix 34), Dominic did not articulate at length about his thinking strategies, but showed critical-thinking ability to infer and also to make connections. He has good use of metalanguage in the Non-fiction text, 0.60, as compared to a much lower score of .27 in the narrative (see ATAF assessment results –Table 8.10). His regulation of cognition is more noticeable in the narrative text.

Table 8.4: Non-fiction sample taken from the Adaptive Think-Aloud Framework Section B frame (Appendix 32) for ID: 1

ATAF Section B: Assessment of critical thinking and metacognitive strategies Case study child participant Dominic (ID: 9) Text: Non-fiction								
Critical-thinking skills/indicators			**Indicators of metacognition**					
	Types of skills observed e.g; predicts, clarifies, links, deduces	Responses from Think Aloud – text taken from Murray (2013, p.17). Dogs at war	**Knowledge of cognition**			**Regulation of cognition**		
			D	P	C	R	E	
Infers	Deduces meaning of *versatile*	It is like … the **most popular** and best dog to **serve** in the army.	√			√	√	

Note. Abbreviations: D = Declarative reasoning; P = Procedural strategies; C = Conditional; R = Regulation of cognition; E = Metacognitive experiences (refer to Chapter 7, Table 7.5 for examples);

Knowledge of cognition (explicit/implied), e.g., references to cognitions including what is known and not known; metalanguage;

Regulation of cognition includes monitoring, reflection, self-correction and evaluation; modal words, pauses or non-verbalisations;

Observations highlighted: **Green** = expressions of metacognitive knowledge and/or regulation of cognition; **Black** = metalanguage; **Purple** = pauses or non-verbal utterances or other mannerisms; **Blue** = modal words.

(ATAF adapted from (Bannister-Tyrrell, 2013; Klingner, 2004; Schellings et al., 2006; Tarricone, 2011a; Whitebread et al., 2009)

Results for Richard (ID: 17) (Table 8.5)

Richard engaged fully with the TA procedure and showed evidence of using four different critical-thinking skills in both textual passages. He showed metacognitive skills (Regulation of cognition) mainly in the non-fiction text analysis in his reflections with evidence of considerable usage of modality, > .70 in both texts. An example of his use of modality is illustrated in Table 8.5. His metalanguage score was in the lower range for both texts. The critical-thinking skill Infers is noted in over .40 of his responses in the Non-fiction text as compared to .56 in the narrative. However, the skill Makes connections is .38 in the narrative text, but only .18 in the factual text.

Table 8.5: Narrative sample taken from the ATAF Section B frame (Appendix 32) for ID: 2

ATAF Section B: Assessment of critical thinking and metacognitive strategies Case study child participant Richard (ID: 17) Text: Narrative								
Critical thinking skills/indicators			**Indicators of metacognition**				
	Types of skills observed e.g., predicts, clarifies, links, deduces	Responses from Think Aloud – text taken from (O'Brien, July 2013, p. 7) *When the lords of earth departed*	**Knowledge of cognition**			**Regulation of cognition**	
			D	P	C	R	E
Makes connections	1. Links to knowledge 2. Deduces meaning of strength to protest	I'm not too sure about protest (…) I'm pretty sure that protest means to fight against like in **parliament** they protest. He did not have the strength to protest – to fight back. (c/c Infers, Clarifies)	√			√	

Note. Abbreviations: D = Declarative reasoning; P = Procedural strategies; C = Conditional; R = Regulation of cognition; E = Metacognitive experiences (refer to Chapter 7, Table 7.5 for examples);

Knowledge of cognition (explicit/implied), e.g., references to cognitions including what is known and not known; metalanguage;

Regulation of cognition includes monitoring reflection, self-correction and evaluation; modal words, pauses or non-verbalisations;

Observations highlighted (refer to Table 8.4)

(ATAF adapted from Bannister-Tyrrell, 2013; Klingner, 2004; Schellings et al; 2006; Tarricone 2011; and Whitebread et al., 2009)

Results for Michael (ID: 21) (Table 8.6)

Michael's TA results indicate a high level of ability in critical thinking and knowledge and regulation of cognition. In the factual text he used all the critical-thinking skills in the Section B frame with the main emphasis on Makes connections and Infers. His stronger metacognitive ability in both knowledge (including metalanguage) and regulation of cognition (particularly modality), highlighted in blue in Table 8.10, was particularly evident in the narrative. His use of modality featured strongly in his regulation of cognition. Michael's competency manifested in a very engaged and lively approach to the TA sessions.

Table 8.6: Non-fiction sample of Think-Aloud taken from the ATAF Section B frame (Appendix 32) for ID: 21

ATAF Section B: Assessment of critical thinking and metacognitive strategies Case study child participant Michael (ID: 21) Text: Non-fiction								
Critical-thinking skills/indicators			**Indicators of metacognition**				
	Types of skills observed e.g., predicts, clarifies, links, deduces	Responses from Think Aloud – text taken from (Catchpole, December 2003-January 2004, p. 11) Bushfires: Preventing a natural disaster	**Knowledge of cognition**			**Regulation of cognition**	
			D	P	C	R	E
Analyses	Deduces meaning of debris	Debris is like rubbish or something, like in a war if a **bomb explodes** there is debris, something that is not supposed to be there. Rubbish from something. (c/c Making connections)	√			√	√

Note**.** Abbreviations: D = Declarative reasoning; P = Procedural strategies; C = Conditional; R = Regulation of cognition; E = Metacognitive experiences (refer to Chapter 7, Table 7.5 for examples);

Knowledge of cognition (explicit/implied), e.g., references to cognitions including what is known and not known; metalanguage;

Regulation of cognition includes monitoring, reflection, self-correction and evaluation; modal words, pauses or non-verbalisations;

Observations highlighted (refer to Table 8.4)

(ATAF adapted from Bannister-Tyrrell, 2013; Klingner, 2004; Schellings et al; 2006; Tarricone 2011; and Whitebread et al., 2009)

Results for Christopher (ID: 22) (Table 8.7)

The strongest feature of Christopher's TA is his use of rich metalanguage in the narrative text, .92 and .86 in the Non-fiction (see Table 8.10). He used a range of critical-thinking skills, particularly in Making connections in both texts, as well as Infers in the narrative. In the narrative, Christopher also showed evidence of strong abilities in metacognition, for example, Declarative reasoning, .92 and Regulation, 1.0. The use of modality is also high in both texts. The factual text was more challenging for Christopher and he sought several times to clarify its content (score of .29).

Table 8.7: Narrative sample of Think Aloud taken from the ATAF Section B frame (Appendix 32) for ID: 22

ATAF Section B: Assessment of critical thinking and metacognitive strategies **Case study child participant Christopher (ID: 22) Text: Narrative**								
Critical thinking skills/indicators			**Indicators of metacognition**				
	Types of skills observed e.g., predicts, clarifies, links, deduces	Responses from Think Aloud – text taken from O'Brien,(2013, p.7) *When the lords of earth departed*	**Knowledge of cognition**			**Regulation of cognition**	
			D	P	C	R	E
Analyses	Deduces	Well I think what is happening is that the witches are trying to go in for an **aerial attack**, but they have been shot down – very badly	√			√	√

Note**.** Abbreviations: D = Declarative reasoning; P = Procedural strategies; C = Conditional; R = Regulation of cognition; E = Metacognitive experiences (refer to Chapter 7 Table 7.5 for examples);

Knowledge of cognition (explicit/implied), e.g., references to cognitions including what is known and not known; metalanguage;

Regulation of cognition includes monitoring reflection, self-correction and evaluation; modal words, Observations highlighted:

Observations highlighted (refer to Table 8.4)

(ATAF adapted from Bannister-Tyrrell, 2013; Klingner, 2004; Schellings et al., 2006; Tarricone, 2011; and Whitebread et al., 2009)

Results for Skye (ID: 24) (Table 8.8)

Skye's responses indicate that in the TAs she used critical thinking and some metacognitive behaviour. In the narrative text she utilised multiple critical-thinking skills, particularly making connections, and showed clear evidence of knowledge of cognition, 1.0, with good use of metalanguage, .65, as well as regulation of cognition including high modality, 1.0. The Non-fiction text was more challenging in terms of content, but whilst the range of thinking behaviours is not as extensive as for the narrative she still exhibits some critical-thinking skills and both sub-components of metacognition, including very good use of metalanguage, .70 and high modality, 1.0.

Table 8.8: Non-fiction sample of Think-Aloud taken from the ATAF Section B frame (Appendix 32) for ID: 24

ATAF Section B: Assessment of critical thinking and metacognitive strategies **Case study child participant Skye (ID: 24) Text: Narrative**								
Critical-thinking skills/indicators			**Indicators of metacognition**				
	Types of skills observed e.g., predicts, clarifies, links, deduces	Responses from Think Aloud – text taken from (Webb, 2001, p. 24) *Sailing to Atlantis: The Sinbad Chronicles*	**Knowledge of cognition**			**Regulation of cognition**	
			D	P	C	R	E
Analyses	Attempts to clarify "a palm frond"	This might be happening in **Afghanistan** with a **plane circling around,** which would be why she is trying to look small. I am not sure about the word *frond* - maybe **the palm in your hand** and it is small. (c/c Making connections)	√			√	√

Note**.** Abbreviations: D = Declarative reasoning; P = Procedural strategies; C = Conditional; R = Regulation of cognition; E = Metacognitive experiences (refer to Chapter 7 Table 7.5 for examples);

Knowledge of cognition (explicit/implied), e.g., references to cognitions including what is known and not known; metalanguage;

Regulation of cognition includes monitoring reflection, self-correction and evaluation; modal words;

Observations highlighted: (refer to Table 8.4)

(ATAF adapted from Bannister-Tyrrell, 2013; Klingner, 2004; Schellings et al.,2006; Tarricone, 2011; and Whitebread et al., 2009)

Results for Miriam (ID: 20) (Table 8.10)

It has been reported that Miriam explained her difficulties with deciphering words in her interviews (Tables 8.1 and 8.3) and yet she showed marked skills in critical thinking in both texts (Table 8.11). Most of these skills involve inference and making connections (to either text or existing knowledge). In both textual passages, she shows strength in Declarative reasoning, 1.0, and Knowledge of cognition, 1.0, with high modality and use of metalanguage in both super categories.

Table 8.9: Narrative sample of Think-Aloud taken from the ATAF Section B frame (Appendix 32) for ID: 20

ATAF Section B: Assessment of critical thinking and metacognitive strategies **Case study child participant Miriam (ID: 20) Text: Narrative**								
Critical-thinking skills/indicators			**Indicators of metacognition**					
Skills	**Types** of skills observed e.g., predicts, clarifies, links, deduces	Responses from Think Aloud – text taken from Webb, 2001, p.24). Sailing to Atlantis: The Sinbad Chronicles	**Knowledge of cognition**			**Regulation of cognition**		
			D	P	C	R	E	
Infers	Deduces meaning of talons	Gigantic cruel talons - I know what **gigantic, cruel** means. Talons – is it like his **claws?** Probably, because it was lifting them up with his gigantic talons – what else would he be lifting them up with! (c/c Making connections)	√	√		√	√	

Note. Abbreviations: D = Declarative reasoning; P = Procedural strategies; C = Conditional; R = Regulation of cognition; E = Metacognitive experiences (refer to Chapter 7 Table 7.5 for examples);

Knowledge of cognition (explicit/implied), e.g., references to cognitions including what is known and not known; metalanguage

Regulation of cognition includes monitoring, reflection, self-correction and evaluation; modal words, pauses or non-verbalisations;

Observations highlighted: (refer to Table 8.4)

(ATAF adapted from Bannister-Tyrrell, 2013; Klingner, 2004; Schellings et al.,2006; Tarricone 2011; and Whitebread et al., 2009)

The Think-aloud protocol provided insights about the participants' critical-thinking and metacognitive abilities employed to make sense of text. The results are varied and show instances, particularly for the Year 6 students, of explicit use of metacognitive knowledge accompanied by evidence of metalanguage. The responses of five of the participants including the four from Year 6 utilise a range of metacognitive skills (regulation of cognition) concurrently with high modality.

Table 8.10: ATAF assessment results for critical thinking and metacognitive skills

1D: 9 Dominic (11 Narrative observations) **Critical thinking:** Infers (.45); Makes connections (.45); Analyses (.09) **Knowledge of cognition:** Declarative Reasoning (1.0); Metalanguage: (.27) **Regulation of cognition:** Regulates (1.0); Modality (.45)
ID: 9 Dominic (Non-fiction observations) **Critical thinking:** Infers (.67); Makes connections (.33) **Knowledge of cognition:** Declarative Reasoning (1.0); Metalanguage: (.60) **Regulation of cognition:** Regulates (.83); Modality (.33)
1D: 17 Richard (21 Narrative observations) **Critical thinking:** Infers (.43) Makes connections (.38); Clarifies (.14); Analyses (.05) **Knowledge of cognition** Declarative Reasoning (.95) ;Metalanguage: (.43) **Regulation of cognition** Regulates (.95) & Modality: (.76); Pauses or non-word responses: (.67)
ID: 17 Richard (9 Non-fiction observations) **Critical thinking:** Infers (.56); Makes connections (.18); Analyses (.11); Evaluates (.11) **Knowledge of cognition** Declarative Reasoning (1.0); Metalanguage: (.44) **Regulation of cognition** Regulates (1.0); Experiences (.33); Modality (.78); Pauses or non-word responses (.33)
1D: 21 Michael (16 Narrative observations) **Critical thinking:** Infers (.31); Makes connections (.19); Clarifies (.19) and Analyses, Evaluates, Questions, Monitors & Solves/resolves (each .06) **Knowledge of cognition**: Declarative Reasoning (1.0); Procedural knowledge (.13); Metalanguage: (.50) **Regulation of cognition**: Regulates (1.0); Experiences (.56); Modality (1.0); Self talk (.13); Pauses or non-word responses (.63)
ID: 21 Michael (10 Non-fiction observations) **Critical thinking:** Makes connections(.30); Infers (20); Clarifies (20); Evaluates (20); Analyses(10) **Knowledge of cognition**: Declarative Reasoning (1.0); Procedural knowledge (.10); Metalanguage (.70) **Regulation of cognition**: Regulates (1.0); Experiences (.20); Modality (1.0)
1D: 22 Christopher (13 Narrative observations) **Critical thinking:** Infers (.46); Makes connections(.31), Clarifies, Analyses; Evaluates (each .08) **Knowledge of cognition:** Declarative Reasoning (.92); Metalanguage: (92) **Regulation of cognition:** Regulates (1.0); Modality (.92)
ID: 22 Christopher (7 Non-fiction observations) **Critical thinking:** Makes connections (.43); Clarifies (.29); Analyses (.14) **Knowledge of cognition:** Declarative Reasoning (.71); Metalanguage (.86) **Regulation of cognition:** Regulates (1.0); Experiences (.29); Modality (.71)
1D: 24 Skye (17 Narrative observations) **Critical thinking:** Makes connections (.35); Infers (.29); Clarifies (.18); Monitors (.06); Evaluates (.06) **Knowledge of cognition**: Declarative Reasoning (1.0); Metalanguage (.65) **Regulation of cognition:** Regulates (1.0); Experiences (.29); Modality:(1.0) ; Self talk (.06)
ID: 24 Skye (10 Non-fiction observations) **Critical thinking:** Infers (.40); Clarifies (.30); Makes connections (.20) **Knowledge of cognition:** Declarative Reasoning (.90) ; Metalanguage: (.70) **Regulation of cognition** : Regulates (1.0) ; Modality: (1.0); Pauses /non-word responses (.20)
1D: 20 Miriam (20 Narrative observations) **Critical thinking:** Infers (.35); Makes connections (.30); Clarifies (.15); Analyses (.05); Monitors (.05); Evaluates (.05) **Knowledge of cognition**: Declarative Reasoning (1.0); Metalanguage: (.80) **Regulation of cognition:** Regulates (1.0); Experiences (.35); Modality (.90); Pauses /non-word responses (.40)
ID: 20 Miriam (13 Non-fiction observations) **Critical thinking:** Infers (.31),Makes connections (.31); Evaluates (.23); Clarifies (.15) **Knowledge of cognition:** Declarative Reasoning (1.0); Metalanguage (.92) **Regulation of cognition** : Regulates (1.0); Experiences (.54); Modality: (1.0); Self-talk (.15)

Note. Yellow highlight = four to six different critical thinking characteristics; Blue = > three indicators of Knowledge of cognition and or Regulation of cognition

8.2.4. Strategy 2: Think-Aloud assessments — Discussion

The following section uses a tabulated summary (Table 8. 11) of the findings for Strategy 2 (TA protocol) and the related main Literature review conclusions to discuss to what extent the TA assessment supports the TCQ. The discussion focuses on i) the pre-TA interview, ii) the ATAF Section A, and iii) the ATAF Section B.

8.2.4.1. Student self-report on reading skills

The findings from the pre-TA interviews regarding the participants' self-report of their reading abilities were useful and showed consistency with remarks made in Strategy 1 of the Case studies 'Interviews with Child participants'. Without implying categorically that the participants had a specific learning difficulty in reading there were indications from the children's self- report of specific difficulties that were not always identifiable using the TCQ.

Of particular note was reference by Miriam (ID: 20) to difficulty in deciphering and tracking printed words and how this limitation slowed the reading process and impacted on her comprehension, particularly when she was tired (Tables 8.2 and 8.3). Her description could be symptomatic of visual processing issues, a type of what Ruban and Reis (2005) refer to as a non-verbal cognitive issue (LRC 4), which can escape teacher detection. Her sibling, an identical twin who reads prolifically, also reported that she had visual issues in her earlier years at school, although not as pronounced. The remaining case-study children, apart from citing issues with reading comprehension, spoke of other issues, including difficulty of deciphering unfamiliar words and two siblings spoke of their concern about the slow speed of their reading. These comments may be reflective of the participants being overly self-critical (Neihart, 2008; Rimm, 2008) (LRC 5) or there may be justification to investigate further, particularly as the comments parallel the earlier interview.

To conclude the review of the children's pre-TA comments, I gained further evidence established in Section 8.1.1 of the value of listening to the student voice. It is clear from the results that standardised test results and even the TCQ cannot on their own provide a true indication of the nature of the difficulties that these Case-study children report experiencing.

Table 8.11: Summary of Literature review conclusions (LRC) and Think-aloud (TA) findings

Phase Two Question: To what extent can the Checklist be supported by other assessment strategies?	
Methodology: MMR Research design: Case studies Strategy 2 **Think Aloud** assessment (including pre-TA interview) A: Data collection: Qualitative A: Data analyses – Qualitative - Content analysis; Quantitative – descriptive statistics	
Literature Review Conclusions (LRC)	**Think-aloud (TA**) Findings
Self-report (Conclusions regarding student's self-report are noted in Table 8.1.) **GLD traits of giftedness and/or LD** 1) Advanced vocabulary and articulacy (Assouline, 2010; Nielsen, 2002; Ruban & Reis, 2005); 2) Advanced metacognitive language, skills, behaviours (Alexander et al.,1995; Bannister-Tyrrell, 2013., Hannah & Shore, 2008) 3) Inconsistent academic skills (Wormald, 2015) 4) Instances of "nonverbal disabilities" and issues with cognitive processing (Ruban & Reis, 2005) 5) Perfectionism/anxiety (Neihart, 2008; Whitmore,1980) **Think-alouds** 6) Can show indications of direct "verbal and non- verbal behaviours" connected to metacognitive functioning (Efklides, 2008, p.284; Whitebread, 2009) and are useful for older students (Veenman, 2005) 7) Student may only articulate what they are aware of at the time of the TA (Jaušovec, 2008) 8) Older GLD students (high school) tend to show more use of regulation of cognition (Hannah & Shore, 2008) 9) Does not suit all children and can be influenced by motivation, anxiety level, age, verbal ability (Ward & Traweek, 1993), and confidence with articulating mental strategies (Veenman, 2005) **Assessing metacognitive ability** 10) Gifted children have advanced metacognitive abilities (Snyder, Nietfeld, & Linnenbrink-Garcia, 2011) with metacognitive skills developing earlier (Alexander et al., 1995; Barfuth, 2009) 11) Developmental nature of metacognition and reading ability (Hannah & Shore, 2008) 12) Metacognitive abilities including regulation can be explicit/ implicit (Whitebread, 2009; Veenman, 2006) **Metacognition and reading comprehension proficiency** 13) Procedural and conditional knowledge more observable in proficient readers (Bannister-Tyrrell, Smith, Merrotsy & Cornish, 2014) 14) Difficulties in reading comprehension are influenced by deficits in metacognitive knowledge/control and also working memory (Carretti, Caldarola, Tencati & Cornoldi, 2014)	**Pre-TA Interviews** Participants self-report about reading: 1) Mostly understood what was read (3 participants) 2) Expressed reservations (3) **ATAF A** Examples of observations 3) Misread more challenging and/or technical words and mostly self-corrected (5 participants) 4) Hesitated before reading more challenging words (2) 5) Moved text closer than 30 cm distance from eyes (1) 6) Used concerted effort to decipher (2) 7) Showed tiredness and/or anxiety (3) 8) Demonstrated varying levels of confidence **ATAF B** Examples of observations 9) Engaged with the TA process = either fully engaged with the process (5) or not articulating at length(1) 10) Indicated varying levels of critical thinking skills with four using a wider range of skills particularly in narratives 11) Showed varying metacognitive abilities in knowledge of cognition with generally strong use of metalanguage in the four Year 6 participants 12) Demonstrated metacognitive skilfulness, including strong use of modal words in the same four participants

8.2.4.2. ATAF Section A

The first part of the actual TA assessments was observing the children's reading skills apropos of the mechanics of reading to ascertain both strengths and possible difficulties that may influence comprehension. As shown in Appendix 31, these observations were recorded in Section A of a prepared Adaptive Think-Aloud framework (ATAF). In the phonological section of the ATAF Section A frame, I focused on decoding, word identification, fluency, intonation, observing punctuation, tracking and word meanings. Overall, based on the reading of a narrative and factual text at their instructional level, the results tended to support the children's own perceptions regarding the challenge of reading unfamiliar words. For instance, there was evidence that the children sounded out more technical words (correctly or incorrectly), misread and usually self-corrected, or showed hesitation. Having the section for other observations was useful in noting any signs of anxiety about the perceived need to perform at their best, or even non-verbal behaviours that could, depending on the behaviour, indicate metacognitive thinking (Efklides, 2008; Whitebread et al., 2009) (LRC 6). It is noted however, that not all non-verbal behaviours indicate metacognitive processing, as there is the possibility that in certain cases they might suggest a mental block due to uncertainty. Two of the children showed an initial level of anxiety, which can be a trait of some 2e children (Ward & Traweek, 1993) (LRC 9), with one reading everything as precisely as she could and expressing possible visual processing issues, and another child sounding out words to make sure that they were correct. Both children had indicated concerns about deciphering new words. Whilst these observations may also be observed in any child motivated to do well in an oral reading assessment and/or may be generally self-critical about his/her reading ability, the evident concerns for the two participants provided a glimpse of the frustrations and other subsequent difficulties experienced by 2e children. It is not assumed that difficulties in reading accuracy and fluency have a significant impact on reading comprehension. Nation, Cocksey, Taylor, and Bishop (2010) found in their longitudinal study of primary school children that the effect of such skills as decoding were found to be minimal on reading comprehension: "Poor comprehenders struggle to comprehend related text despite having age appropriate levels of reading fluency and accuracy" (p. 1038). This study was also reported by Carretti, Caldarola, Tencati, and Cornoldi (2014).

8.2.4.3. ATAF Section B

The most relevant aspect of utilising an assessment of critical thinking skills and metacognitive ability was comparing these self-regulatory processes to the findings of the TCQ. I would suggest that whilst the TCQ provides several indications of critical-thinking prowess and inferences of metacognitive ability there is a need for a specific tool such as the TA protocol to provide online data – to further complement the TCQ. This section commences with a review of the children's results and comparison to the interviews and TCQ, and Literature review conclusions in Table 8.11.

Dominic (ID: 9, Year 3)

The key aspect of Dominic's TA was his understating of strategies to provide clear insight about metacognitive capacity and critical thinking. Without over interpreting his brief responses, it is noted that there are factors that impact on young readers such as the developmental nature of reading and metacognition (Hannah & Shore, 2008) (LRC 11) and his age (9 years), personality, level of motivation, interest (Ward & Trewak, 1993) (LRC 9) and even confidence in articulating mental strategies (Veenman, 2005) (LRC 9). It is possible also that he may only have articulated strategies that he was aware of at that particular time (Jaušovec, 2008) (LRC 7), with perhaps some even being implicit (Veenman et al., 2006; Whitebread et al., 2009) (LRC 12), but not detected in the TA procedure. Whilst there is evidence to suggest that metacognitive skills develop earlier in gifted children (LRC 10) (Alexander et al., 1995; Barfurth et al., 2009), Hannah and Shore's (2008) findings that high school boys show greater metacognitive skills in reading comprehension, compared to younger boys (LRC 8) is a further instance of the individuality of the developmental process in children of various abilities, doubly so for the complex field of 2e. In terms of the question of Dominic's interest in the text, it was evident that he used more sophisticated language in the non-fiction text as compared to the narrative, perhaps an indication of his preference for factual material. The other point to consider is that he refers in both interviews to difficulty in remembering what he has read, which may or not reflect a working memory (WM) issue (Carretti et al., 2014) (LRC 14). Both job-share teachers noted his difficulties with memory in the TCQ. Veenman (2005) notes that deficits in WM can affect articulation of mental strategies. Furthermore, although Dominic has not been diagnosed as being gifted, nor with reading difficulties,

van Viersen, Kroesbergen, Slot, and de Bree (2016) in their study of 121 Dutch children including gifted children with dyslexia show that WM was not found to be an issue but rather a clear strength. However, not all GLD children have strength in WM as evidenced by Fugate, Zentall, and Gentry (2013) in their study of children with gifted ADHD. As aforementioned, Dominic has a chronic health issue which together with early childhood ear difficulties noted in the TCQ, may have delayed reading skills and confidence in expressing thinking strategies.

Richard (ID: 17, Year 5)

In his TA interview, Richard makes reference to being aware of the need for a greater understanding of the meaning of new words, and whilst he shows some metacognitive ability and uses metacognitive language, he does not utilise the more sophisticated vocabulary of the participants in Year 6. He uses the critical-thinking skills of inference and making connections so it is apparent that he has strategies to interpret text, but is delayed in terms of his ability to decode more challenging words and consistently know their meanings. It is acknowledged that Richard is one of the youngest participants (Year 5) and may not as yet have secured an advanced knowledge of vocabulary or for that matter metalanguage due to his current stage of development. However, as noted in his RSPM results he was definitely above average in his score (< 90^{th} percentile) and in the Superior range (95^{th} percentile) in an earlier test two years earlier. It is possible that Richard has an underlying learning disability which may explain his declining results in standardised reading tests as the complexity of written text and associated demands increase in the higher years of his education.

Michael (ID: 21, Year 6)

Michael's high level of interaction with the TA protocol was reflected in marked metacognitive and critical thinking behaviours, which is likely to reflect his high ability (Snyder, Nietfeld, & Linnenbrink-Garcia, 2011) (LRC 10). His prowess is quite remarkable considering his relatively short time in an English-speaking school. In fact, his strong metacognitive skills (Alexander et al., 1995; Bannister-Tyrrell, 2013; Hannah & Shore, 2008) (LRC 2) are likely to be influenced by his reading proficiency (Bannister-Tyrrell et al., 2014) (LRC 13). The assessment strategy suits his strong verbal skills also typical of GLD (2e) (Assouline et al., 2010; Nielsen, 2002; Ruban & Reis, 2005) (LRC 1). Michael's results tended to reflect his overall intellectual ranking of Often in the TCQ. In

spite of the issue he perceives in focusing (LRC 4), which is also noted by his teacher in the TCQ, he was fully immersed in the process, including making judgements and raising queries.

Christopher (ID: 22, Year 6)

Christopher's main feature was his strong use of metalanguage (Alexander et al., 1995; Bannister-Tyrrell, 2013; Hannah & Shore, 2008) (LRC 2), suggesting an ability to articulate metacognitive knowledge in both text types, although with a leaning to the narrative. The results of his TA seem to contradict his Uncertain/Sometimes ranking in the Intellectual category of the TCQ, in spite of achieving high results in his online reading comprehension in 2013. Perhaps this contrast may reflect the inconsistent academic skills typical of 2e (Wormald, 2015) (LRC 3), or that his true ability may be masked by an LD (Krochak & Ryan, 2007) that may reflect a non-verbal processing issue (Ruban & Reis, 2005) (LRC 4). In the TCQ there is reference to his sensory processing issues.

Skye (ID: 24, Year 6)

Skye's TA responses reflect her passion, indicated in both interviews, for reading narratives and it was not surprising to observe more skills both in critical thinking and particularly in metacognitive processing in the narrative text. It was noted that the non-fiction text was more challenging, with unfamiliar content, and she utilised fewer strategies to make sense of the text. There is insufficient data to come to any conclusions rather than note her reference to early tracking issues and her overcoming these by immersion in reading narratives.

Miriam (ID: 20, Year 6)

Miriam's results reflect strong metacognitive capacity in both knowledge and regulation of cognition. These findings illustrate the point made previously, that challenges with the mechanics of reading (Nation et al., 2010) do not necessarily impact on comprehension, however, in terms of completing longer formal tests, the length of time taken to decipher words may exacerbate anxiety levels (Neihart, 2008; Rimm, 2008) (LRC 5) and impact on reading results in higher education. The use of the TA highlights Miriam's advanced critical thinking and metacognitive ability that was not accessed in the TCQ.

After reviewing the findings on the TA assessments, including the pre-TA interview and the ATAF Section A focusing on reading mechanics and behaviours, it is very evident that the TA strategy provides a further vital source of data in addressing the principal focus of the research — opening doors of possibility for twice-exceptional children through utilising initial assessment strategies.

8.3. To what extent do the first two Case-study strategies support the findings of the TCQ?

Review of the results of Strategy 1 Interviews with child participants and Strategy 2 the Think-aloud assessments shows that there are instances of parallel findings to the TCQ categories in several items of the Intellectual and Academic difficulties categories, but generally they add another layer of data particularly about the children's perspectives of their reading ability. Several of the children's interviews parallel teacher observations in the TCQ of instances of issues with remembering longer instructions, level of focus, and reading competency. However, there were examples where issues with decoding more complex/technical words and in the case of one child, significant delays in processing text, were not detected in the TCQ. It is reasonable to assert the usefulness of the student voice as a strategy to support the TCQ.

In terms of the TA protocol it is not feasible to argue that the results reflect the findings of the TCQ, in the Intellectual and Academic difficulties categories, because it is an online strategy and results of the questionnaire are retrospective. Furthermore the two types of observations have been noted by Helms-Lorenz and Jacobse (2008) not to necessarily correlate. However, because of the insights this strategy provides in terms of reading and metacognitive ability, I consider the TA protocol a strategy that supports the TCQ. The limitations of this strategy are discussed in Chapter 10.

The following chapter focuses on the results and discussion of the remaining strategies, the RSPM and the PTQ. The chapter then concludes with a review of all four strategies to determine to what extent other strategies support the TCQ.

Chapter 9. Phase Two: Case studies (Non-verbal intelligence test and Parent/Teacher Questionnaire) — Results and Discussion

> ... Instead of altering their views to fit the facts, they alter the facts to fit their views which can be very uncomfortable if you happen to be one of the facts that needs altering (Doctor Who, The Face of Evil, 1977) (Wheldall, 2010).

The remaining two strategies involved in the Case studies to address the Phase Two question *To what extent can the Checklist (TCQ) be supported by other assessment strategies?* are Strategy 3, the non-verbal intelligence test Raven's Standard Progressive Matrices (RSPM), and Strategy 4, the Parent/Teacher Questionnaire (PTQ). The chapter utilises the same structure as Chapter 8 in presenting the results followed by discussion for both of the assessment strategies. Prior to each of the discussion sections, a tabulated summary of key findings and relevant Literature study conclusions is included (adapted Cornish, 2012).

9.1. Strategy 3: Raven's Standard Progressive Matrices

I sought to determine whether there were any discrepancies or similarities between the children's results in RSPM (Table 9.1), the TCQ findings, the Literacy results in National Assessment Plan Language and Numeracy (NAPLAN) (Table 9.2), and the school online standardised test assessments (Table 9.3). The six Case-study participants, including their TCQ group (refer to Section 6.2.2) are shown in Table 9.1, starting with the youngest child, ID: 9 Dominic (Year 3). The following section outlines the results for each of the participants.

9.1.1. Child participants' results

Dominic (ID: 9, TCQ Group 3) shows average results (GRADE III) in RSPM, which are consistent with his standardised test results, but there is variation with his TCQ results in the Intellectual category. He is ranked by one of his teachers as Sometimes and the other Often, which suggests a level of uncertainty about his true ability. Interestingly, he scored an above-average score of Stanine 7 in the ACER General Ability Test (AGAT) (Stephanou et al., 2008a) in 2012, which is likely to reflect prowess in one or more of the

areas being assessed, namely verbal, numerical and abstract reasoning. The term Stanine refers to one of nine categories of achievement in a standardised test with the following rankings:

- Stanines 1–3 (very low to low)
- Stanines 4–7 (average to high-average)
- Stanines 8–9 (high to very high)

(Australian Council for Educational Research Ltd, 2011)

Dominic, in the AGAT 2012 Numerical items, scored 90%, so it is possible that AGAT may be a more suitable measure of his general intelligence. However, his NAPLAN Numeracy results indicate below-school-average results (Table 9.2). Interestingly, in the online testing in the same year he doubled his Mathematics stanine from 4 to 8 over the two tests (Table 9.3).

Richard (ID: 17, Group 3) scored above-average RSPM results (< 90th percentile), but there is a marked contrast to his TCQ results in the Intellectual category, with a mean ranking of Not observed to Uncertain. In 2010 he scored in the 95th percentile of RSPM. His school standardised test results from 2011 to 2012 reflected an overall average result in reading comprehension (Appendix 19), which declined to below-average, Stanines 3 and 4 in the online test results in 2013 (Table 9.3). His NAPLAN results in 2013 are all below-school average (Table 9.2).

Table 9.1: Raven's Standard Progressive Matrices (RSPM) results for 2013 and assessments from previous years

Child Participant's pseudonym, TCQ identification and group number	September 2013 RSPM Assessment			General intelligence tests from previous years		
	Perc'tile	RSPM grade	Observable behaviours during assessment	May 2010 RSPM Assessment		Other 'g' tests
				Perc'tile	RSPM grade	
Dominic ID: 9 (Group 3)	<50th	GRADE III Intellectually average	At times distracted by children visiting the library	N/A	N/A	AGAT 7 2012
Richard ID: 17 (Group 3)	< 90th	GRADE II Definitely above the average in intellectual capacity	Complete focus and then checked every response meticulously	95th	GRADE I	
Michael ID: 21 (Group 3)	90th	GRADE II+ Definitely above the average in intellectual capacity	Constant shaking of leg; completed test early and didn't check responses systematically	No RSPM	N/A	
Chris ID: 22 (Group 3)	50th	GRADE III Intellectually average	Complete focus in spite of other children being in a nearby classroom	75th	GRADE II Definitely above the average in intellectual capacity	
Skye ID: 24 (Group 2)	< 90th	GRADE II Definitely above the average in intellectual capacity	Complete focus and checked responses	95th	GRADE I Intellectually superior	
Miriam ID: 20 (Group 2)	95th	GRADE I Intellectually superior	The last to finish and glanced around on several occasions to check if others had finished. She was very thorough and did not have time to check through her responses	95th	GRADE I Intellectually superior	

Note. TCQ group and identification = child participants' trialling group and identification number from the Phase One trial of the TCQ; Percent'ile = Percentile

Michael (ID: 21, Group 3) scored well above average in Raven's (GRADE II+), which complemented his results in the Intellectual category of the TCQ. His result in reading comprehension was Stanine 5 in 2012, but improved in the two 2013 online testing scores, Stanine 6 and 7 respectively. His spelling age is noted to be well above his chronological

age. All his NAPLAN results in English were above school average, but within the achievement range of middle 60% of students for the year in Australia, except reading where he was more advanced. Michael who has a non-English speaking background has been in Australia for three years and the general improvement in his results may reflect his greater skills and understanding of English.

Christopher (ID: 22, Group 3), has average results in RSPM (GRADE III) as compared to his higher 2010 GRADE II results ("Definitely above the average in intellectual capacity"). His TCQ Intellectual category results are ranked as Uncertain to Sometimes. Christopher's results in reading comprehension have been in the above-average range, although he was only rated as Sometimes achieving a high standardised test result in the TCQ, probably due to the variations in his online results in 2013 in comprehension and Mathematics.

Skye (ID: 24, Group 2) revealed above average RSPM results (Grade II) in 2013 and "Intellectually superior" in 2010, and these assessments appear to be consistent with her TCQ Intellectual ranking of Often to Always. Her teacher notes in the TCQ that she sometimes reveals a high score in one or more of the standardised test results, as evidenced by her 16+ spelling age. Skye's reading comprehension in PAT reading (Stephanou et al., 2008b) and mathematics' results in PAT Mathematics (Stephanou & Lindsey, 1997) are average, for example, Stanine 5 to 7. Her reading results in NAPLAN 2012 indicate an above-school and an above-middle range for Australian students in Band 7.

Table 9.2: NAPLAN results for the Case-study participants

Child participants	Achievement scale bands				
	Reading	Writing	Spelling	Grammar and punctuation	Numeracy
ID: 9 Dominic 2013	5/6*	5/6	5/6*	6+	4/6*
ID: 17 Richard 2013	6/8*	5/8*	6/8*	6/8*	6/8*
ID: 21 Michael 2012	7/8	6/8	7/8	5/8*	6/8*
ID: 22 Christopher 2012	8/8	7/8	5*	7/8*	7/8
ID: 24 Skye 2012	7/8	7/8	7/8*	8+	8+
ID: 20 Miriam 2012	7/8	8/8	7/8	8+	8

Note. Abbreviations: * = below school average; yellow highlight = score beyond achievement range of middle 60% of students for the year in Australia; blue highlight = below national average

Skye's results in the online testing in 2013 (Table 9.3) are less than the strong NAPLAN range, but remain within the average band. In her interview reviewed in Chapter 8, she commented about issues with vision when she was younger, so I was interested to check if interpreting text on a sloped computer screen as compared to a horizontal hard copy would show any difference in achievement. The results are not in the strong range in the two online tests in 2013, although there is improvement noted in the second.

Table 9.3: Online test results for the Case-study participants

Online test results for the case study children – April and November 2013													
Participant's identification number and pseudonym	**Age Years Months**	**PAT Maths Plus**				**PAT R-Comprehension**				**SA Spelling**			
		Per	St	Per	St	Per	St	Per	Stan.	Raw sc	Spell Age	Raw sc	Spell Age
ID: 9 Dominic	9.7	29	4	94	8	63	6	50	5	N/A	N/A	N/A	11.4
ID: 17 Richard	10.2	22	4	26	5	16	3	21	4	N/A	9.6	N/A	11.5
ID: 21 Michael	11.2	14	3	34	4	72	6	88	7	59	16+	63	16+
ID: 22 Chris-topher	11.2	30	4	46	5	55	5	96	8	36	9.6	43	10.8
ID: 24 Skye	11.7	42	5	72	6	61	6	88	7	48	13.0	59	16+
ID: 20 Miriam	11.7	61	6	91	8	36	4	61	6	48	13.0	58	16+

Note. Abbreviations: Per = percentile; St = stanine; Raw sc = Raw score; Spell Age = Spelling age; Columns highlighted in grey are April results and the remaining columns November

In her RSPM score Miriam (ID: 20, Group 2) is ranked "Intellectually superior", as was the case in her assessment in 2010, but in the category of the TCQ her average ranking is in the mainly Often range. Her NAPLAN results in reading (Table 9.2) are just above the school average, but within the middle range for Australian students. Miriam's online testing in reading comprehension, although not strong had improved from Stanine 4 to 6. She has a high result in her spelling age.

9.1.2. Strategy 3: Non-verbal intelligence test (RSPM) – Discussion

The discussion centres on whether the RSPM findings support the TCQ results. A summary of the results in relation to each child's TCQ Intellectual category ranking and

NAPLAN (reading and numeracy), current online standardised test results and the key relevant Literature review conclusions (LRC) is tabulated for reference (Table 9.4).

Table 9.4: Summary of RSPM findings and Literature review conclusions

Phase Two Question: To what extent can the Checklist be supported by other assessment strategies?						
Methodology: Mixed Methods Research; **Research design**: Case studies Methods: Data collection – Quantitative (Raven's Standard Progressive Matrices) Data analyses – Standardised test results comparisons to TCQ findings						
Literature review conclusions (LRC)	**Child participant and ID**	**Checklist Intellectual ranking**	**RSPM**	**NAPLAN Reading**	**NAPLAN Numeracy**	**Online School standardised test results**
1) The use of intelligence tests can lead to the identification of 2e children who otherwise may be unidentified (Assouline & Whiteman, 2011); 2) 2e children do not always succeed in standardised tests due to the nature of their learning difficulties (Silverman, 2009b; Montgomery, 2009); and 3) Test errors can contribute to inaccurate assessment of ability. (Colangelo et al., 1993; Ziegler et al., 2012).	ID: 9 Dominic	Sometimes–often	GRADE III Average	Below school average	Below school average	Average; one Mathematics' result is above average
	ID: 17 Richard	Not observed–uncertain	GRADE II Above-average (< 90th percentile) **	Below national average	Below school average	Low–average in reading and mathematics
	ID: 21 Michael	Often	GRADE II+ Above-average (90th percentile)	Above school average	Below school average	Average reading; low–average in mathematics
	ID:22 Christopher	Uncertain–sometimes	GRADE III Average	Above school average	School average	Average–high reading; average mathematics
	ID: 24 Skye	Often	GRADE II Above-average (< 90th percentile) **	Above school average	Above school average	Average reading and mathematics
	ID: 20 Miriam	Sometimes–Often	GRADE I Intellectually superior (95th percentile)	School average	Above school average	Low–average reading; average mathematics

Note. Yellow highlight = test ceiling; RSPM scores of GRADE III = "between 25th and 75th percentiles", GRADE II = ≥ 75th percentile, GRADE II+ = "at or above the 90th percentile" and GRADE I = ≥ 95th percentile for students "of the same age group" (Raven et al., 2000, p. 69); ** = Intellectually superior ranking two years earlier

The RSPM findings present a further layer of data regarding intellectual capacity, which together with my observations during the test complement the TCQ findings in two of the cases, but raise questions about the other members of the cohort. Michael (ID: 21) and Skye (ID: 24) are ranked as Often in the Intellectual category and scored in the definitely

above-average range of RSPM indicating high reasoning ability (and in the superior range two years ago). It is noted that RSPM measures fluid intelligence and the TCQ Intellectual category covers a range of items connected to Intellectual ability, but the point to be made is that for these two participants there are parallel results. However, in contrast, the result of Richard (ID: 17) appears contradictory. He was ranked in the Not observed to Uncertain range in the TCQ, but definitely above-average in RSPM and "Intellectually superior" two years before in earlier testing. Adding to his inconsistent results he scored mostly below-average standardised test results. Without presuming that Richard is twice-exceptional, the discrepancy is an instance of the value of a psychometric intelligence test in detecting problem-solving ability which is otherwise unidentified (Assouline & Whiteman, 2011) (LRC 1). Furthermore, if this student has a processing difficulty, standardised tests (such as PAT reading and mathematics and even RSPM) may be difficult (Mills et al., 1993; Montgomery, 2009; Rimm, 2008; Silverman, 2009b) (LRC 2). It is also possible that these tests may have been influenced by the not infrequent issue of test error (Colangelo et al., 1993; Ziegler et al., 2012) (LRC 3).

Further insights were obtained for the remaining three participants, which also deem RSPM a useful assessment tool. Interestingly, Miriam (ID: 20), the identical twin of Skye (ID: 24), scored in the 95th percentile of RSPM, but fluctuations in reading comprehension results and her teacher's Intellectual ranking in the Sometimes/Often range suggest a discrepancy. It was noted in Appendix 14, Open responses from the TCQ, that her teacher questions her comprehension skills. During the RSPM test session she checked, several times, to see if other students had finished, and although she ran out of time (Table 9.1) it is likely that her very thorough approach supports her difficulties and is a compensation strategy (Silverman, 2009b). A contrasting dilemma exists with Dominic (ID: 1) and Christopher (ID: 22) who are siblings and whose RSPM results could reflect the Intellectual ranking of the TCQ (Sometimes-to-Often for one and Uncertain to Sometimes for the other.) It is also possible that the style of the RSPM non-verbal test type does not suit the two participants, but indications that Dominic, in spite of inconsistent standardised test results, achieved a high result in Mathematics and was ranked by one of his job-share teachers as Often in Intellectual capacity may warrant further assessment. Christopher, too, would be a candidate for further review with his contrasting high achievements in reading but uncertain Intellectual capacity from the TCQ.

Whilst the Literature review noted some reservations about RSPM in terms of a possible ceiling effect and not being necessarily related to school performance (Section 2.7.2), it is apparent from the Case studies that its measure of what Mills, Ablard & Brody (1993, p. 3) refer to as "very general abstract reasoning ability" does support the TCQ. This support, however, does not necessarily mean complete agreement, but rather a useful indication of both verification of the TCQ Intellectual rankings and the need for more investigation of cases where ability is possibly still to be realised or further unravelled. Multiple assessments, where practicable for teachers, are of course advantageous, particularly in the case of possible 2e where there can be inconsistencies in test performance (Foley Nicpon et al., 2011; Rimm, 2008).

9.2. Strategy 4: The Parent/Teacher Questionnaire (PTQ)

The PTQ was developed for the Study and was used in the Case studies. In considering the benefits of triangulation in obtaining information from various data sources, I was interested to use its visual analogue scale to explore whether the perspectives of parents would give a further understanding of the strengths/difficulties of the Case-study child participants and how these views compared with the TCQ findings. It was noted in Chapter 7 that the results of both job-share teachers have been included in the analyses. The procedures of data collection/analyses are shown in Figure 9.1.

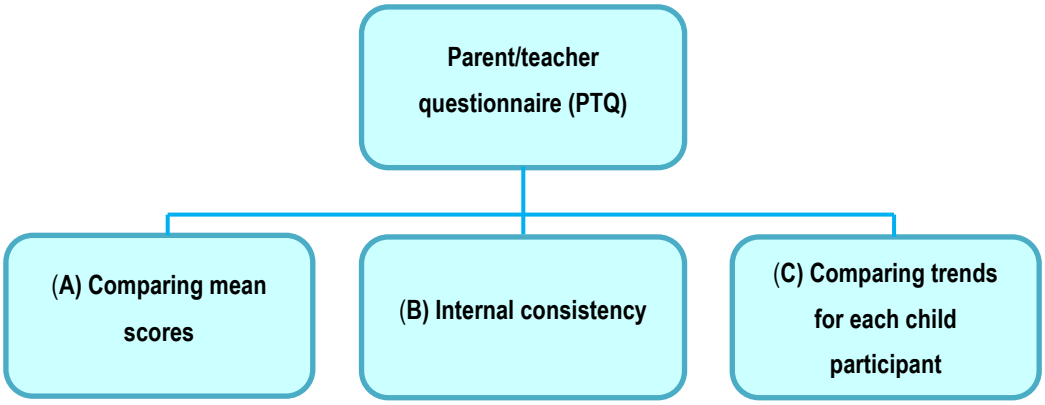

Figure 9.1: PTQ data analyses

9.2.1. PTQ: (A) Comparing mean scores

The mean scores of parents and teachers in the five sub-scales of the PTQ, namely Potential, Cognitive style, Achievement, Interpersonal relationships and Intrapersonal relationships suggest that parents and teachers, including job-share Teacher 1(TJS1) and job-share Teacher 2 (TJS2), are, overall, viewing the children similarly (Figure 9.2). (As shown in the List of Abbreviations and acronyms, JS1 refers to job-share Teacher 1 and JS2 to job-share Teacher 2. All five teachers plus job-share Teacher 1 are referred to as TJS1 and the five teachers including job-share Teacher 2 are abbreviated to TJS2. The graphs are trending towards higher scores in the Potential, Interpersonal and Intrapersonal sub-scales. Although both parents and teachers have a similar mean response in Cognitive style and Achievement, the scores are lower compared to the other sub-scales.

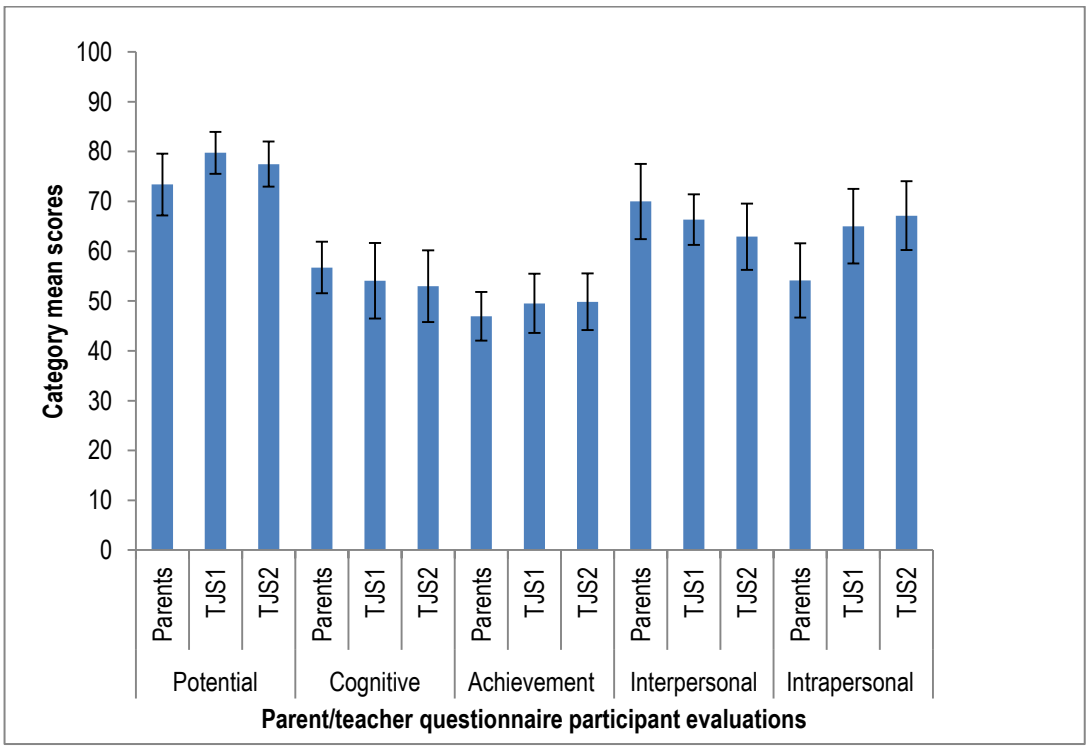

Figure 9.2: Graph of Parent/teacher Visual Analogue Categories/Sub-scales mean score
Note. Parents = six parents; TJS1 = all five teachers plus job-share teacher 1, TJS2 = all five teachers plus job-share Teacher 2

9.2.2. PTQ: (B) Internal consistency

The Cronbach's alpha results, for each of the five PTQ sub-scales shown in Table 9.5 and Appendix 38 are mostly positive, but with variations between parents and teachers. Parents' results are good, that is >.7 (Field, 2013; Pallant, 2013) in the sub-scales Potential, Interpersonal and Intrapersonal but lower in Cognitive style and Achievement,

.65 and .50 respectively. Teachers' results were similarly good for Potential and Intrapersonal, as well as for Cognitive style and Achievement.

Table 9.5: Cronbach's alpha scores for Parents and teachers from the VAS

Subscale	Cronbach's	Number of items
Potential		
Parents Teachers (JST1) Teachers (JST2)	.79 .69 .77	8
Cognitive style		
Parents Teachers (JST1) Teachers (JST2)	.58 .67 .79	11
Achievement		
Parents Teachers (JST1) Teachers (JST2)	.38 .79 .78	10
Interpersonal relationships		
Parents Teachers (JST1) Teachers (JST2)	.82 .34 .62	6
Intrapersonal relationships		
Parents Teachers (JST1) Teachers (JST2)	.73 .82 .81	7

Teachers including job-share Teacher 2 (TJS2) shared the parents' consistency in the Interpersonal sub-scale, but teachers with job-share Teacher 1 (TJS1) yielded a very low result, .34. To summarise, the PTQ subscales show internal consistency for parents for four of the five categories (including Cognitive style, .58) and all of the sub-scales for teachers (TJS2) and four with teachers (TJS1).

With the variation in results, particularly in the Achievement and Interpersonal sub-scales, inter-item statistics accompanying the Cronbach's scores were reviewed to determine if there were any items that could possibly be removed to increase the internal consistency of the category items being considered. In the Achievement subscale, reliability for this sample would improve for the parents from .38 to .54 by removing the item about not always being motivated by school work and remain good for teachers (TJS1), at .74 and

for (TJS2) at .74. For Interpersonal relationships, teachers (JST1) would improve to .60 by removing leadership skills, and parents would remain good at .75, and teachers (TJS2) would be the same at .62. The question of suitability of these adjustments is reviewed in Section 9.2.5.2.

9.2.3. PTQ: (C) Comparing parent and teacher perspectives for each child

The raw scores of parents and teachers were graphed for each of the six child participants for comparison purposes and the five graphs for each participant are located in Appendix 37. In the Note section for some graphs (Cognitive, Achievement, Intrapersonal and Interpersonal) an item followed by the letter R, indicates that the meaning has been reversed (see Chapter 7, Section 7.5.2). There are varying distributions across the five sub-scales, but two samples of graphs have been selected from Appendix 37 for each Case-study participant that best illustrate the key observations/comparisons in terms of addressing the Phase Two question: *To what extent can the Checklist be supported by other assessment strategies?* It will be noted that one of the graphs for Dominic (ID: 1) contains the graphed results for his parent and two job-share teachers – job-share Teacher 1 (JS1) and job-share Teacher 2 (JS2).

Dominic (ID: 9)

For Dominic, his results in the Potential subscale are generally evenly distributed, suggesting that parent and teachers are in agreement about his potential in a number of items or variables (Figure 9.3). However, JS2 does not share the high rating given by the parent and JS1 in verbal communication and reasoning skills.

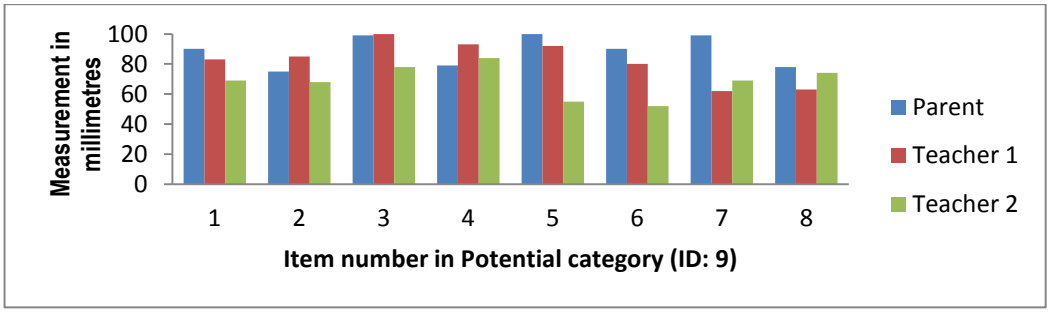

Figure 9.3: **Graph of Parent/teacher perceptions of Potential for child participant ID: 9 Dominic**
Note. Variable 1 = Ease of learning new concepts, 2 = High level of talent in at least one area, 3= Enthusiasm for learning, 4 = In-depth knowledge, 5 = Strong verbal communication, 6 = Strong reasoning skills, 7 = In-depth questions, 8 = Very creative

In Cognitive style, there is marked variation for Dominic between the two teachers, particularly in their judgement of how he kept track (Variable/Item 6) and degree of forgetfulness (8) and yet there was agreement between the parent and JS1 (Figure 9.4). There is a marked difference between parent and teachers assessment of his capacity to complete tasks expeditiously (7). Overall, the parent's rating is higher than the two teachers across most of the variables in this sub-scale.

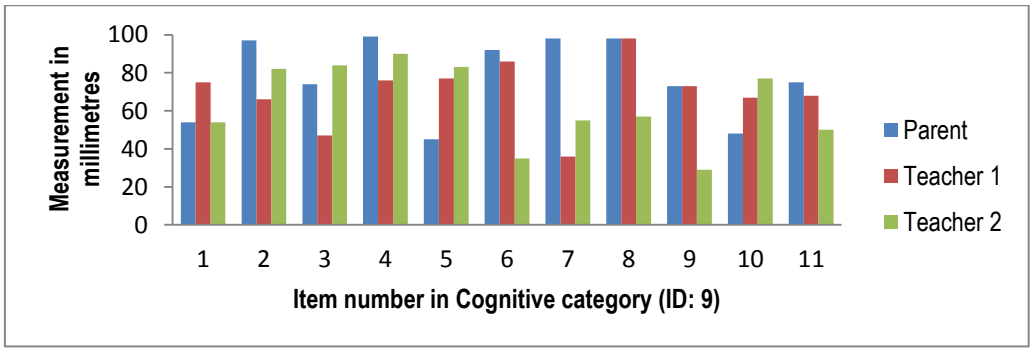

Figure 9.4: Graph of Parent/teacher raw scores for Cognitive style ID: 9 Dominic

Note. Variable 1 = Doesn't prefer to learn step by step (R); 2 = Grasps big picture instead of learning step by step; 3= Remembers verbal information; 4 = Prefers to see it for understanding; 5 = Follows verbal instructions easily; 6 = Keeps track (R); 7 = Doesn't take time to finish (R); 8 = Not forgetful (R); 9 = No difficulty in planning (R); 10 = Sustains attention; 11= Remembers long instructions (R)

Richard (ID: 17)

Overall, the graphs for Richard show some similarities (Appendix 28) but marked variation, particularly in the Cognitive category, for example in three of the items connected to memory, namely 8, 9 and 11 (Figure 9.5). Lower results are evident in his preferred learning style (1 and 2) particularly for the parent, and in recall of verbal information for both respondents (3).

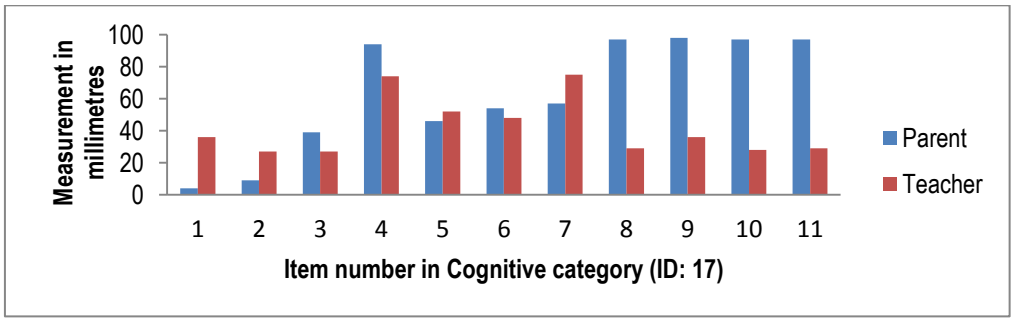

Figure 9.5: Graph of Parent/teacher perceptions of Cognitive style for child participant ID: 17 Richard

Note. Variable 1 = Doesn't prefer to learn step by step (R); 2 = Grasps big picture instead of learning step by step; 3= Remembers verbal information; 4 = Prefers to see it for understanding; 5 = Follows verbal instructions easily; 6 = Keeps track (R); 7 = Doesn't take time to finish (R); 8 = Not forgetful (R); 9 = No difficulty in planning (R); 10 = Sustains attention; 11= Remembers long instructions (R)

The Achievement subscale for Richard shows variation in scores in several items, but both parent and teacher are relatively consistent in not perceiving issues with clarity of articulation (2), motivation (6), reading comprehension (7), and mathematics (8) (Figure 9.6). The parent identifies a significant gap between verbal ability and written expression (9) in contrast to the teacher's view.

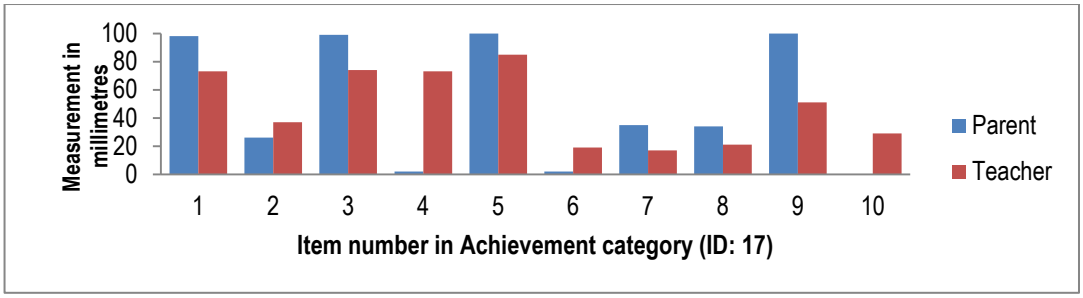

Figure 9.6: Graph of Parent/teacher perceptions of Achievement for child participant ID: 17 Richard
Note. Variable 1 = Achievement results at school can vary, 2 = Doesn't explain his/her ideas clearly (R); 3 = enjoys doing repetitive tasks; 4 = Has difficulties in handwriting and presentation; 5= Needs to be actively engaged in learning (at school or at home), 6 = Doesn't always feel motivated by school work; 7 = Experiences challenges with reading comprehension; 8 = Experiences challenges in mathematics; 9 = Shows a gap between verbal ability and written expression; 10 = Doesn't shows proficient computer skills (R)

Michael (ID: 21)

The results for Michael show fairly even distribution in the parent's and teacher's views, particularly in the Potential sub-scale (Figure 9.7). The scores are mostly trending towards the higher end of the scale. There is a marked difference between parent and teacher perspectives about his enthusiasm for learning (3).

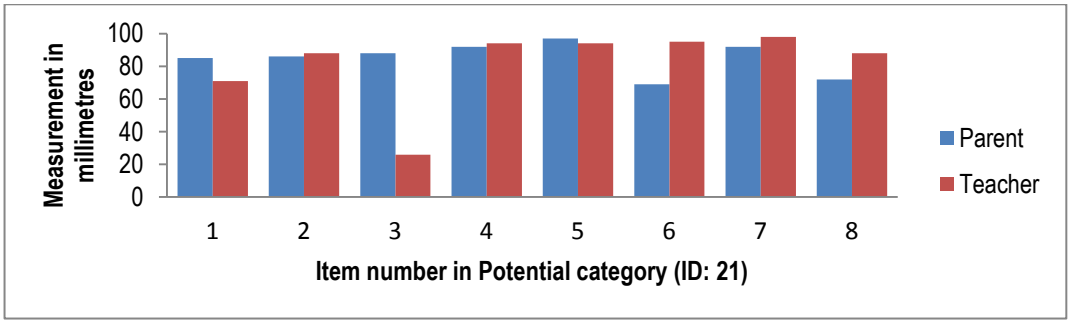

Figure 9.7: Graph of Parent/teacher perceptions of Potential for child participant ID: 21 Michael
Note. Variable 1 = Ease of learning new concepts, 2 = High level of talent in at least one area, 3= Enthusiasm for learning, 4 = In-depth knowledge, 5 = Strong verbal communication, 6 = Strong reasoning skills, 7 = In-depth questions 8 = Very creative

In Michael's Achievement results (Figure 9.8), there is consistency between parent and teacher, apart from how he is perceived by both respondents in enjoyment of repetitive tasks (3). There is strong agreement by parent and teacher that his results can vary (1), has

handwriting /presentation issues (4), needs to be actively engaged (5), and is not always motivated by school (6). They both agree that there are minimal difficulties with reading comprehension (7), expressing himself clearly (2) and showing a gap between verbal ability and written expression (9).

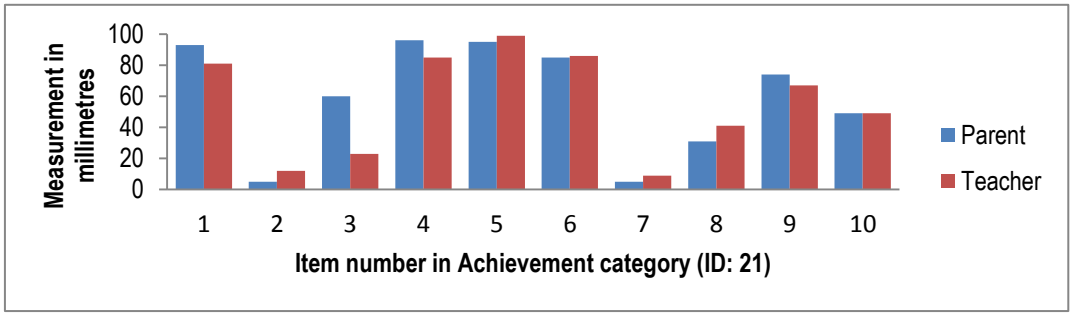

Figure 9.8: Graph of Parent/teacher perceptions of Achievement for child participant ID: 21 Michael

Note. Variable 1 = Achievement results at school can vary, 2 = Doesn't explain his/her ideas clearly (R), 3 = enjoys doing repetitive tasks, 4 = Has difficulties in handwriting and presentation, 5= Needs to be actively engaged in learning (at school or at home), 6 = Doesn't always feel motivated by school work, 7 = Experiences challenges with reading comprehension, 8 = Experiences challenges in mathematics, 9 = Shows a gap between verbal ability and written expression, 10 = Doesn't show proficient computer skills (R)

Christopher (ID: 22)

For Christopher, the distribution pattern in the five sub-scales shows marked variations between parent and teacher. The Potential sub-scale (Figure 9.9), for instance, only shows one item where parent and teacher are in relative agreement, which is a lower score related to his ease of learning new concepts (1). Interestingly, the parent gives an optimal rating in high level of talent (2) and verbal communication (5), with the teacher's view being considerably less. Conversely, it is the teacher agreeing that Christopher has strong reasoning skills (6), asks in-depth questions (7) and is very creative (8).

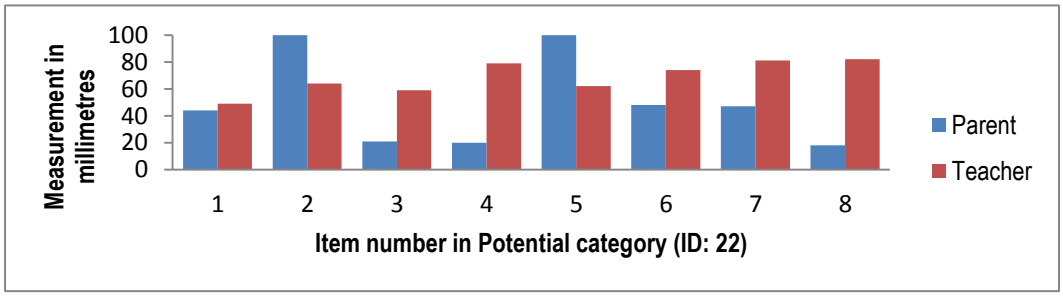

Figure 9.9: Graph of Parent/teacher perceptions of Potential for child participant ID: 22 Christopher

Note. Variable 1 = Ease of learning new concepts, 2 = High level of talent in at least one area, 3= Enthusiasm for learning, 4 = In-depth knowledge, 5 = Strong verbal communication, 6 = Strong reasoning skills, 7 = In-depth questions, 8 = Very creative

In Christopher's Achievement sub-scale (Figure 9.10) there are also instances of marked differences between parent and teacher views, with only the teacher agreeing strongly that

he needs to be actively engaged (5), and has challenges in comprehension (7) and in mathematics (8). Of particular note, the parent and teacher both agree strongly that i) his achievement results vary (1), ii) he has difficulties in handwriting/presentation (4), iii) shows discrepancy between verbal ability and written expression (9) and vi) doesn't always feel motivated by school.

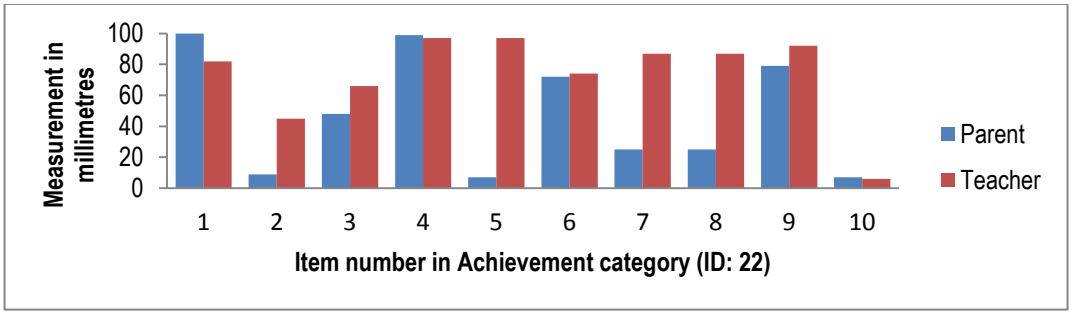

Figure 9.10: Graph of Parent/teacher perceptions of Achievement for child participant ID: 22 Christopher

Note. Variable 1 = Achievement results at school can vary, 2 = Doesn't explain his/her ideas clearly (R), 3 = enjoys doing repetitive tasks, 4 = Has difficulties in handwriting and presentation, 5= Needs to be actively engaged in learning (at school or at home), 6 = Doesn't always feel motivated by school work, 7 = Experiences challenges with reading comprehension, 8 = Experiences challenges in mathematics, 9 = Shows a gap between verbal ability and written expression, 10 = Doesn't shows proficient computer skills (R)

Skye (ID: 24)

The overall pattern for Skye shows a number of items in all sub-scales that are rated similarly between parent and teacher, and the differences are generally not marked. In the Potential sub-scale however, Skye's teacher strongly agrees with strengths in her verbal communication (5), reasoning skills (6), and asking in-depth questions (7), contrasting with the parent (Figure 9.11).

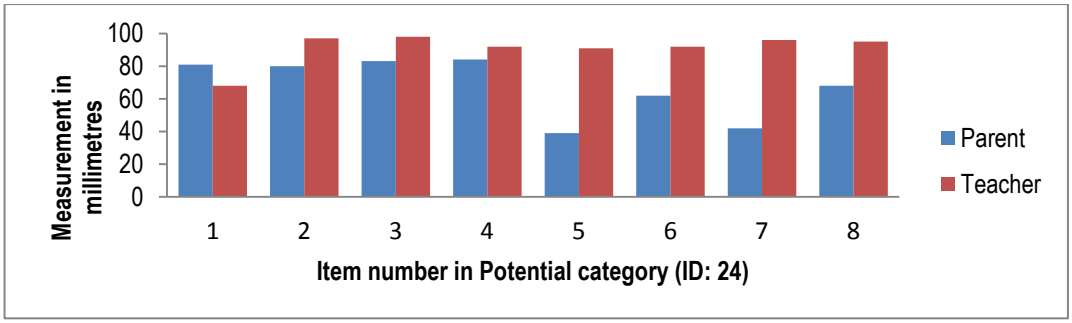

Figure 9.11: Graph of Parent/teacher perceptions of Potential for child participant ID: 24 Skye

Note. Variable 1 = Ease of learning new concepts, 2 = High level of talent in at least one area, 3= Enthusiasm for learning, 4 = In-depth knowledge, 5 = Strong verbal communication, 6 = Strong reasoning skills, 7 = In-depth questions 8 = Very creative

In six of the seven items in the Intrapersonal sub-scale, the teacher consistently ranks Skye higher than does the parent, which is markedly so in the item related to perfectionism (2),

as well as being self-critical (4) (Figure 9.12). The respondents are almost identical in ranking her highly in sensitivity (1) and also in her strong work ethic (6).

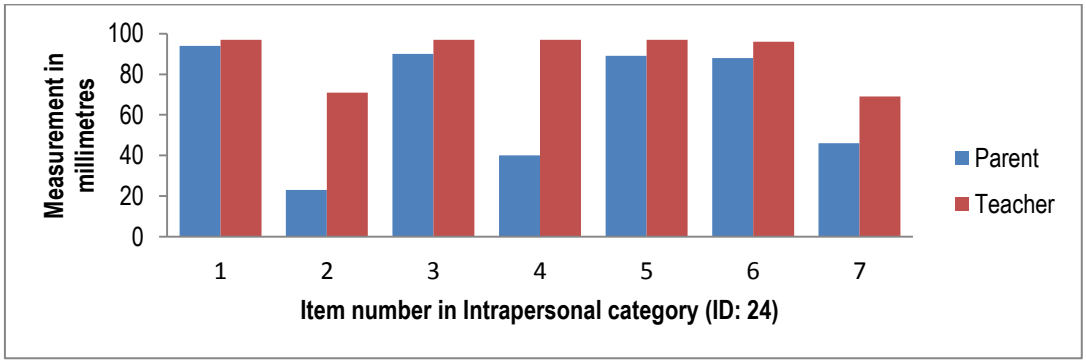

Figure 9.12: Graph of Parent/teacher perceptions of Intrapersonal factors for child participant ID: 24 Skye
Note. Variable 1 = Is sensitive, 2 = Perfectionist and worries about making mistakes, 3 = Doesn't give up on a task if frustrated (R), 4 = Can be self-critical, 5 = Can experience anxiousness, 6 = Likes to work hard to achieve a goal, 7 = Can place an excessive demand on himself/herself

Miriam (ID: 20)

For Miriam, there are also variations between her parent's and teacher's perspectives, examples of which are evident in the Potential sub-scale (Figure 9.13). The teacher consistently scores her more highly, particularly in enthusiasm (3) and verbal skills (5).

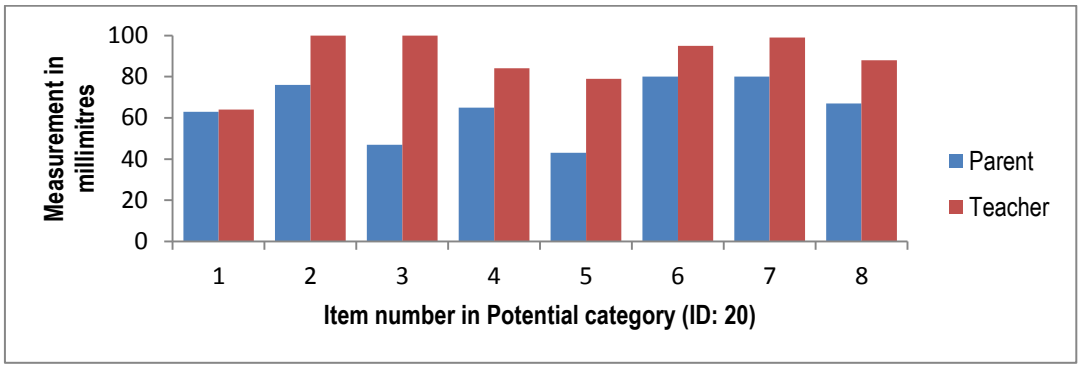

Figure 9.13: Graph of Parent/teacher perceptions of Potential for child participant ID: 20 Miriam
Note. Variable 1 = Ease of learning new concepts, 2 = High level of talent in at least one area, 3= Enthusiasm for learning, 4 = In-depth knowledge, 5 = Strong verbal communication, 6 = Strong reasoning skills, 7 = In-depth questions, 8 = Very creative

The results in Cognitive style, for Miriam, indicate considerable differences between perceptions of her teacher and parent (Figure 9.14). For instance, the parent perceives that her daughter only has mild issues with i) remembering verbal information (3), ii) forgetfulness (8) and iii) following verbal instructions (5), which contrast with the teacher's views.

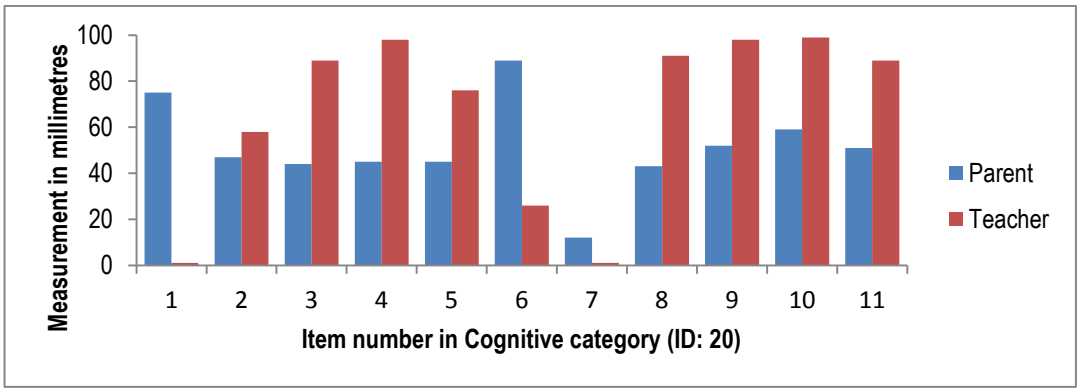

Figure 9.14: Graph of Parent/teacher perceptions of Cognitive style for child participant ID: 20 Miriam

Note. Variable 1 = Doesn't prefer to learn step by step (R), 2 = Grasps big picture instead of learning step by step, 3 = Remembers verbal information, 4 = Prefers to see it for understanding, 5 = Follows verbal instructions easily, 6 = Keeps track (R), 7 = Doesn't take time to finish (R), 8 = Not forgetful (R), 9 = No difficulty in planning (R), 10 = Sustains attention, 11= Remembers long instructions (R)

Comparing the raw scores of parents and teachers provided insights about their perceptions of the child participants in all five sub-scales. There were variations, some minor and others considerable, and also similarities. Looking at results from the TCQ, the RSPM and open responses from both questionnaires (TCQ and PTQ) common patterns were evident, but so too were some contradictions.

9.2.4. PTQ optional open responses

The PTQ has a section for open responses, which some parents and teachers used for reflections about the child participants. The responses have been summarised and checked for inter-rater reliability, and are included in Table 9.6. From the summary, it is apparent that some parent data for four of the participants (ID: 9, 22, 24 and 20) reflect insights gained from the TCQ, and/or the interviews with the children, particularly, regarding written expression issues, certain anxieties and memory compensation. A parent has made reference to a face validity issue regarding the variation in meaning of the word 'sensitivity', whilst a teacher was uncertain about the response to make for some questions. There were other data that added further to the overall picture about the particular participants, such as an auditory processing issue and variation between school and specialist perceptions.

Table 9.6: Summary of parent and teacher optional open responses to the Parent/Teacher Questionnaire

Child identification number	Parent	Teacher 1 and or Teacher 2
ID: 9	Reflective, questions and has an enquiring mind	Uncertain about how to rate ID: 1 on several responses, but responded instinctively; Concerned about ID: 1 not being identified for true ability
ID: 17	Contrast between school based and specialist perceptions; uncertainty about learning style and possible over-excitabilities; very mature; uncertain about the item sensitivity due to its different contextual meanings	
ID: 22	Written expression is compromised due to extra focus on spelling; auditory processing issue	Focus and application affected by interest
ID: 24	Empathetic; self-management of anxiety	
ID: 20	Compensates for issues in reading with strong memorisation skills; keen sense of justice	Timed tests can cause anxiety

Note. There were no responses for ID: 21

9.2.5. Strategy 4: PTQ — Discussion

The following section will compare the findings of the PTQ in relation to the TCQ and Literature review conclusions (LRC). A summation of the key LRC and the findings are tabulated (Table 9.7). The discussion also compares the PTQ results to the other three Case-study assessment strategies.

9.2.5.1. (A) Mean results

Overall parents and teachers viewed the children similarly, including the lower scores in Cognitive style and Achievement. The parallel perceptions (with small variations) by parents and teachers in the Potential subscale would appear to be in line with Kärkkäinen and Räty's study in Finland (2009) (Kärkkäinen & Räty, 2009), where they noted a positive and moderate correlation between parents' and teachers' estimation of third- and sixth-grade children's potential in learning skills in Finnish and Mathematics. It is also noted, however, from other literature sources that it is parents who often are more knowledgeable regarding their children's strengths and learning difficulties (Assouline et al. 2010; Wormald et al., 2014) and often are vital advocates for their children's learning (Dare & Nowicki, 2015; Neumeister, Yssel, & Burney, 2013) (LRC 3). In the PTQ the lower scores in Cognitive style and Achievement may indicate that the constructs are more complex and, consequently, the traits may be less readily identifiable, or that overall the cohort is just not being viewed as strongly as in the other sub-scales.

Table 9.7: Summary of Literature Review conclusions and PTQ findings

Literature review conclusions	(A) PTQ mean results	(B) Internal consistency	Child ID	(C) Individual trends
1) Parents are vital to the process of identification and intervention (Dare & Nowicki, 2015; Wormald, Rogers & Vialle, 2015); 2) Parents involvement is vital owing to direct experience of their children's needs (Dare & Nowicki, 2015); and 3) Parents would benefit from resources to support their advocatory role for their children (Dare & Nowicki, 2015).	Parents and teachers generally have similar views about: 1. Potential; 2.Cognitive style; 3.Achievement; 4.Interpersonal relationships; and 5.Intrapersonal relationships. Scores in Cognitive style and Achievement are lower.	<u>Parents</u> All sub-scales except Achievement (.38) and Cognitive style (.58) <u>Teachers (JST1)</u> All sub-scales except Interpersonal (.34) <u>Teachers (JST2)</u> All sub-scales except Interpersonal is.62	Dominic ID: 9	**Similarities**: P/T (1and 2) **Potential** = strengths; **Differences**: JST2 = verbal communication & reasoning skills not as strong as P/T (1); P/T (1) **Cognitive style** = strong in keeping track, not being forgetful & no difficulty in planning (contrasts with JST2); and **Open**: P = enquiring mind; JST1 = uncertain about several responses; JST2 concerned about being unidentified.
			Richard ID: 17	**Similarities**: P/T **Achievement** = needs to be actively engaged; **Differences**: P/T **Cognitive style** = marked variations e.g., Parent strongly agrees he can sustain attention; and **Open**: P = contrast between specialist and school perceptions; uncertain about use of term *sensitivity*.
			Michael ID: 21	**Similarities**: P/T **Potential** = mainly strengths, except only parent notes enthusiasm for learning; **Achievement**: P/T = parallel views agreeing strongly that he has difficulties in handwriting, has a gap between verbal ability and written expression and has no issues with reading comprehension; and **Differences**: T = low enthusiasm for learning (**Potential**).
			Chris-topher ID: 22	**Similarities**: P/T **Achievement** = strength in computer skills; gap between verbal ability and written expression; difficulties in handwriting and school performance varies; **Differences**: P/T **Potential** = marked variations, e.g., Parent only gives very high rating in verbal communication and Teacher notes in-depth knowledge; and **Open**: P = efforts with spelling compromise written expression; auditory processing issue; and T= level of interest affects focus and application.
			Skye ID: 24	**Similarities**: T **Potential** = high rating; P = some similarities & marked variation, e.g., doesn't note verbal ability; **Differences**: T **Intrapersonal** = Teacher only notes tendency to worry and be self-critical; and **Open**: P= empathy; self-managing anxiety level.
			Miriam ID: 20	**Similarities**: P/T **Potential** = strength in learning new concepts, and reasoning skills; **Differences**: P/T **Cognitive style** = marked variations, e.g., Parent only notes strongly that she can keep track; and **Open**: P = Compensates for reading issues with excellent memory; keen sense of justice; T= anxiety arises with timed tests.

Note. Abbreviations: ID = Identification number; P= parent; T= teacher; P/T = parent and teacher; P/T (1 and 2) = parent and two job-share teachers (JST1 and JS

9.2.5.2. (B) Internal consistency

The results for the PTQ's internal consistency/reliability indicate instances of consistency and inconsistency. Parents and teachers are rating the children more consistently in Potential and Intrapersonal sub-scales, indicating items where there is more agreement. One of the main inconsistencies is the difference in the Achievement sub-scale between parents with a low Cronbach's alpha score, as compared to a high score for the teachers. This result may suggest that teachers have the benefit of experience in the classroom to judge the range of possible academic achievement difficulties as compared to the parents. There was a high Cronbach's α for parents in the Interpersonal, which may reflect a more comprehensive awareness of their children's traits in this category – a point that further illustrates the importance of including the parent voice in the identification process (Dare & Nowicki, 2015; Wormald et al., 2015) (LRC 1).

A marked inconsistency also occurs in the Interpersonal sub-scale for teachers (TJS1), with a very low measure of internal reliability (0.34) as compared to the higher scores for the other two groups of respondents, particularly the parents (.82). This contrast means that for teachers TJS1 there was more variation than consistency in responding to the items in this construct, that is, the items in the subscale didn't "correlate positively with one another" (Gregory, 2015, p. 108).

A further point to be made in relation to the discrepancies in the Achievement and Interpersonal sub-scales is that the face validity of the PTQ is also likely to be influenced by the experience base from which the respondent is evaluating the child. How a teacher may rate a child, from their classroom experience, on all of the TPQ sub-scales, may contrast to a parent's perception from the home environment. For this small sample, face validity could also be influenced by the parent's and teacher's experience with the child on the day of the assessment. However, although face validity may have influenced the two instances of discrepant results, a questionnaire with "extremely strong face validity" can still produce possible contradictions (Gregory, 2015, p. 122). It is also important to note that whilst there was some benefit in considering the reliability of the sub-scales in their initial trialling, the result is a reminder that although there are encouraging results, the discrepancies, particularly as a result of outliers, can influence a measure of the internal consistency in a small sample (Pallant, 2013).

Overall, the teachers' views suggest that the PTQ has promising internal reliability as a possible teacher assessment tool on four of the five categories for teachers TJS1 and TJS2 as compared to three of the five categories by parents. It is noted that the Cronbach's alpha in Achievement for Parents and in Interpersonal relationships for TJS1 could be improved, but it is impracticable for a small sample and it is also preferable to maintain the current items for further trialling which, with a big enough sample/s, would warrant a factor analysis.

9.2.5.3. (C) Individual trends and comparisons to other Case study strategies and the TCQ

The individual trends for each of the Case-study participants in comparison to their results in the TCQ, the Interviews and Think-aloud assessments (Chapter 8) and the RSPM are reviewed in this section. Table 9.8 presents an overview of all the findings.

Dominic (ID: 9) – TCQ Group 3, Year 3

The main finding for Dominic is that his results, overall, tend to be non-remarkable, apart from a high score in a standardised Mathematics test. However, in the PTQ, the parent and the two job-share Teachers (JS1 and JS2), identified his intellectual potential. His parent also commented about his enquiring mind in the PTQ. Dominic's significant long-standing health issues noted in the TCQ are likely to have impacted on achievement and confidence levels. His interviews (that is, the first assessment strategy, as well as the shorter pre-TA interview), consistently refer to his perception of having difficulties remembering both longer instructions and recalling what he has read. He also referred to handwriting difficulties, which is noted particularly by JS2 in the TCQ. She also ranked the discrepancy between verbal ability and written skills, and between written work and potential as Always. Interestingly, JS2 did not rate Dominic as having handwriting problems in the PTQ, in contrast to the parent and JS1. Both teachers, though, strongly acknowledged the gap between verbal ability and written expression. The pattern of results evident from multiple strategies suggests that there are issues limiting the expression of his potential.

Table 9.8: Oveview of the TCQ Intellectual ranking and Case-study assessments

Phase Two Question: To what extent can the Checklist be supported by other assessment strategies?										
Methodology: Mixed Methods Research; **Research design**: Case studies **Methods**: Data collection – Quantitative (Ravens Standard Progressive Matrices); Data analyses – Standardised test results comparisons to TCQ findings										
Child and ID	**Checklist Intellectual ranking**	**Checklist categories with exceptional items**	**Interviews: areas children identify as problematic**	**Think-aloud: Critical thinking and Metacognition**	**RSPM**	**NAPLAN Reading**	**NAPLAN Numeracy**	**Online school standardised test results**	**Parent/teacher comparisons**	
									PTQ mean scores	**PTQ individual child scores**
ID: 9 Dominic	Sometimes to Often	JST2 = Intellectual, Academic difficulties	Reading, handwriting, longer instructions		GRADE III Average	Below school average	Below school average	Average; one Mathematics' result is above average	Overall similar trends for parents and teachers; Higher mean scores in Potential, Interpersonal and Intrapersonal sub-scales.	Similarity and marked variations
ID: 17 Richard	Not observed to Uncertain	Muscular	Mathematics; comprehension; remembering instructions; focus	Strong inferential skills	GRADE II Well above average **	Below national average	Below school average	Low–average in reading and mathematics		Marked variations in Cognitive and Achievement
ID: 21 Michael	Often	Intellectual, Creative, Academic difficulties, Other behaviours	Completing tasks; focusing	Very strong	GRADE II+ Well above average	Above school average	Below school average	Average reading; low–average in mathematics		Generally even distribution
ID:22 Chris-topher	Uncertain to Sometimes	Perceptual, Academic difficulties, Socio-emotional, Other behaviours	English – spelling; distractible	Strong metacognitive language	GRADE III Average	Above school average	School average	Average–high reading; average mathematics		Marked variations
ID: 24 Skye	Often/ Always	Creative, Social, Socio-emotional needs	Handwriting, not achieving higher results in ICAS*		GRADE II Well above average **	Above school average	Above school average	Average reading and mathematics		Generally even distribution
ID: 20 Miriam	Sometimes/ Often	Creative	Not achieving higher results in tests; slow reading and comprehension; concentration	Very strong	GRADE I Intellectually superior	School average	Above school average	Low–average reading; average mathematics		Variations particularly in Intrapersonal and Potential

Note. ** = Intellectually superior ranking two years earlier; Abbreviation ICAS = International Competitions and Assessments for Schools which are conducted annually (Educational Assessment Australia (EAA), 2017); Categories with exceptional items = 'Always' ranking for one or more items;

Richard (ID: 17) – TCQ Group 3, Year 5

Richard's results from the TCQ are exceptional in the Physical category, but not so in the Intellectual category, where he is ranked in the Not observed to Uncertain range. However, in marked contrast, his RSPM results are definitely above average and were also in the superior range in his Year 2 result. These strong results may reflect his strong inferential skills in the TA assessment. Richard consistently identified problems with reading in his interviews, particularly not knowing the meaning of a number of words, which was observed in his TA oral reading skills. However, in spite of his self-report being evidenced by below-average standardised reading results, issues with both reading mechanics and comprehension are scored as not observed in the TCQ. Adding more to Richard's complex profile, his parent noted in the PTQ that there is a discrepancy between school and specialist reports.

Christopher (ID: 22) – TCQ Group 3, Year 6

Christopher's ranking by his teacher in the Intellectual category of the TCQ suggests that his potential is inconclusive and, in spite of his stronger results in standardised reading tests, is ranked as Sometimes having difficulties with reading mechanics and comprehension, and strongly so in the TPQ (in contrast to the parent). The TCQ indicates issues with i) writing, both in coordination and spelling, and ii) discrepancy between written work and potential. In the open responses, mention is also made of sensory integration challenges. The difficulties in his writing were verified by his parent in her observation that his efforts in spelling compromise his written expression. Christopher also identifies spelling as a problem, as well as the slower pace of his reading. However, in spite of these apparent difficulties, the TA results indicate that he is highly articulate and uses advanced metacognitive language, which tend to contradict his overall ranking in the TCQ intellectual ranking and his non-remarkable RSPM results.

Skye (ID: 24) – TCQ Group 2, Year 6, identical twin of ID: 6 Miriam

For Skye, both her parent's and teacher's perceptions in the TPQ Potential sub-scale generally parallel both her TCQ Intellectual ranking of Often and RSPM result of definitely above average. Her result in an earlier test in Year 3 indicated that she was in the Superior range. However, in the PTQ Potential category, Skye's parent's view of her having strong verbal communication skills and asking in-depth questions is considerably lower than the teacher. Her parent also draws attention to her marked sense of empathy and her improved self-management of anxiety, which is reflected in her ranking in the TCQ Socio-emotional category, where the teacher indicates Sometimes or Often in several items, for example, with regards to demanding self-expectations, and doubts about academic adequacy. Of note is Skye's observation in her pre-TA interview that she used to experience tracking issues, which have been improved due to her prolific reading. Whilst reading results are generally strong, it was noted in her TA assessment that she hesitated over more challenging words and preferred to read them and self-correct according to the context of the passage rather than sound them out. Like her twin, she too may be utilising compensatory auditory skills. Her TA analysis of the non-fiction text indicated less proficiency in articulating strategies when unsure of the content.

Miriam (ID: 20) – TCQ Group 2, Year 6, Skye's identical twin

Miriam's problem-solving ability was highlighted by the RSPM, where she scored in the superior range, a score consistent with an earlier test in Year 3. This result was paralleled by evidence of very strong ability to make sense of text in the TA strategy. Her ranking in the Intellectual category of the TCQ is overall in the Sometimes -to-Often range. Of particular relevance was Miriam's explanation in the Interview of the issues that she has with reading. The likelihood of a visual processing issue in a child who is ranked in the Intellectually superior range in RSPM, illustrates the importance of a comprehensive assessment approach and even more importantly that it carries with it the chance of the child being assessed professionally and receiving appropriate intervention. Related to this self-report, her teacher notes in the TCQ Socio-emotional category and in the open section of the PTQ, that she can become anxious particularly when confronted with timed standardised tests. As indicated, I observed during the RSPM testing, her checking on several occasions to see if others had already finished. A further point is Miriam's

remarkable memory which her parent in the PTQ feels compensates for her reading difficulties.

To summarise the findings for the Case-study participants, there are key themes that have been identified, which reflect typical traits of 2e. The traits that occur in one or more of the children are:

1. high ability in the Intellectual or another category of the TCQ (Gagné, 2010);
2. inconsistent academic performance (Leggett, Shea, & Wilson, 2010; Neihart & Betts, 2010);
3. handwriting coordination issues (Montgomery, 2009);
4. discrepancy between verbal ability and written expression (Assouline et al., 2010; Montgomery, 2015);
5. usually strong verbal skills and use of metalanguage (Bannister-Tyrrell, 2013; Hannah & Shore, 1995);
6. issues with reading (Munro, 2002; Wills & Munro, 2009);
7. use of a compensatory strategy (Silverman, 2009b);
8. critical thinking skills (Leggett et al., 2010);
9. possible learning disabilities (e.g., visual processing, sensory integration, ADHD) (Rogers, 2012)

Although it cannot be concluded from these traits that any of the children is twice-exceptional, the varied combinations would warrant further review by teachers and learning-support staff.

9.3. To what extent do the four strategies support the findings of the Teacher Checklist Questionnaire?

The results for the child participants suggest that the findings of the TCQ are largely complemented by the four Case-study assessment strategies, particularly in identifying possible strengths in the Mental categories and difficulties in the Academic and Social-emotional categories. However, there are variations which are understandable in terms of individual judgements and the type of assessment strategy. Teacher judgements may not always be accurate in terms of the multiple children in their classes, and parents, whilst possibly having a little bias, can have, as mentioned, a greater accuracy than teachers (Wormald et al., 2014). Also, assessment strategies such as RSPM and the TA may not be

suited to detecting high ability in some children. In my investigation to date, I have not located evidence to suggest that the non-verbal RSPM may disadvantage any children who may not have strength in visuo-spatial awareness. In relation to the TA, its emphasis on articulating strategies of critical thinking and metacognition although suited to the typical verbal strengths of 2e (Assouline et al., 2010) may not suit some individuals. These assessment strategies are not without their limitations and these are addressed further in the following chapter.

To the Phase Two question, I would argue that the four assessment strategies of interviews, Think-aloud assessment, Raven's Standard Progressive Matrices and Parent/teacher questionnaire, support the TCQ findings, but as aforementioned, not necessarily meaning full agreement. Rather each assessment, allowing for such factors as possible test error, respondent bias or uncertainty, presents further triangulated data to capture a more complete understanding of each child, whether or not he/she is twice-exceptional. Time restraints for classroom teachers are not conducive to multiple testing strategies, particularly the TA and individual interviews, but where possible they assist in capturing a more complete picture, necessary for the initial identification of 2e.

The following chapter presents a summary of the TCQ and the four Case-study assessment strategies noting their contribution to the question of opening the doors of possibility for gifted children with learning difficulties. It will also review the strategies' limitations and make recommendations for further study.

Chapter 10. Summary and Conclusions

> We do not believe in ourselves until someone reveals that deep inside us something is valuable, worth listening to, worthy of our trust, sacred to our touch. Once we believe in ourselves we can risk curiosity, wonder, spontaneous delight or any experience that reveals the human spirit. E. E. Cummings (cited in Anderson & Frison, 1992)

Thoughts return to the earlier years of teaching and to the many children and parents who have been an integral part of my journey. Particular recall rests with children who were outside the norm and presented with the asynchrony of a truly remarkable ability and insights that belied their years (Silverman, 2009b). There were also possible twice-exceptional children, who experienced the more complex asynchrony of high ability coexisting with impairment to learning, which often manifested in multiple areas of learning difficulties. I reflect on the profound challenges that teachers face in identifying and addressing all children's strengths and needs, including 2e, which are influenced by teacher pre-service education, professional development, experience, access to suitable resources, class sizes and the varying locational, cultural and socio-economic contexts of primary schools. Many 2e children remain unidentified and, over time, socio-emotional issues associated with underachievement, feelings of inefficacy (Bandura, 1997), and exposure to educational programs that may not ignite an interest in learning (Crim et al., 2008), can take their toll. By the end of primary school this limiting combination can lead to children developing an almost impenetrable, defensive shield.

The quest to find initial strategies to identify the strengths and difficulties of 2e children, as a basis for review of appropriate educational intervention, was the driving force behind the Study. I endeavoured to develop a teacher checklist questionnaire that was relevant, manageable, and that could be used in the preliminary stage of the identification process. This aim led to a Mixed Methods Research study with the title, *Opening the doors of possibility for gifted/high-ability children with learning difficulties: Initial identification strategies for primary school teachers*. Questions arose about how the need for initial identification strategies could be addressed. The question for Phase One is: *What are the components of a comprehensive, useful checklist for the preliminary stage of identifying possible gifted/high-ability children with learning difficulties?* This focal question was addressed through the research design of Participatory Action Research (PAR). The question for Phase Two utilised a case-study design and is: *To what extent do other*

assessment strategies support the findings of the Checklist? The Study was, therefore, an exploratory investigation and was conducted in a primary school in a Diocese of New South Wales, Australia.

10.1. Phase One: Developing and trialling the comprehensive, useful preliminary assessment tool — the Teacher Checklist Questionnaire (TCQ)

Phase One, using the research design of PAR, utilised a combination of mixed methods of data collection and analyses. The relevant chapters and a summary of their key content are listed as follows:

Chapter 4 Phase One: Research Methods focused on the methods involved in addressing the TCQ's requirements for:

- *comprehensiveness* via the Teacher Checklist Questionnaire Development sub-phase (TCQD), which included the Teacher Perceptions Questionnaire (TPQ), a Staff meeting presentation, and the specific development of the TCQ by the teacher focus-group; and
- *usefulness* through the Trial and analyses (TCQT).

Chapter 5 Phase One: TCQD — Results and discussion centred on:

- the TPQ, the Staff meeting presentation and teacher focus-group development of the TCQ.

Chapter 6 Phase One: Teacher Checklist Questionnaire Trial (TCQT) — Results and discussion incorporated:

- analysis of the TCQ sub-scale reliability, category correlations, and individual and group comparisons and open-ended TCQ teacher responses.

The key advantages of the PAR design as reviewed in Chapter 3, Section 3.2.4.1, were evident in the Study with teachers involved in the various stages of Phase One, including a review of twice-exceptional traits in a staff meeting presentation and in the TPQ, consultation in the selection process of the child subjects, and involvement in the trialling phase and reflection on the TCQ's suitability. The process could be likened to multi-faceted professional development.

10.1.1. Phase One: Teacher Checklist Questionnaire Trial (TCQT) — Summary of key findings and relevance to the primary school context

The findings from the TCQT, based on 10 teachers' evaluations of 24 child subjects, are encouraging but need to be interpreted in the light of a relatively small exploratory study. Key findings of particular relevance for both the Study, and for primary school educators, are included under the following sub headings of: TCQ – Comprehensiveness, and TCQ - Usefulness.

10.1.1.1. TCQ – Comprehensiveness of its category items

A comprehensive and clear Checklist with minimal implication of labelling

The TCQ has two sections: Section A categories based on the six Natural-ability domains from Gagné's DMGT 2.0 (2008 update) (Gagné, 2010), or from his Expanded Model of Talent Development EMTD (2013) (Gagné, 2013), and Section B with three recognisable categories of learning difficulties within the school context. Gagné's Model was selected mainly because it is generally accepted by all States and Territories in Australia (ACARA, n.d.-b), as well as internationally. The TCQ is comprehensive in terms of being based on literature findings, both research-based and anecdotal, as well as being complemented by teacher knowledge/experience. The range of categories allows teachers wider scope to view children's possible strengths and difficulties. The word 'possible' is included because the TCQ is not designed to be diagnostic, but is rather an investigatory tool for initial teacher enquiry about possible 2e traits and even for multiple-ability groups within the primary school context. All category items were worded in a way to minimise premature labelling and were reviewed by the teacher focus-group, including myself as the researcher, for clarity. (Prior to the trialling of the TCQ the teacher focus-group tested the tool for clarity and manageability by evaluating several anonymous children, the process of which was akin to a pilot.) For teachers utilising the tool, the TCQ draws attention to the multidimensionality of giftedness and learning difficulties – a clear advantage of using Gagné's DMGT 2.0 as well as the three learning difficulty categories.

10.1.1.2. TCQ — Usefulness

Clear perceptions of individual profile and comparisons between specified groups

Findings from the trial of the TCQ indicated variations between each individual and between selected groups (Groups 1, 2 and 3). The selected children for the trialling phase were in three nominal groups, any of which may be similar in composition to what may be found in a cohort of 2e children. Group 1, consisting of children with at least one high standardised test result and no teacher-detected learning difficulty, represented a quasi-control group (Ziegler et al., 2010). This Group did not exclude the possibility of 2e because some children only start manifesting learning difficulties as the demands of the curriculum increase (Brody & Mills, 1997), which is generally in the later years of primary school. Group 2 was similar in composition to Group 1, but the children may have possible learning difficulties. Group 3 consisted of possible hidden 2e children, whose ability was uncertain and who tended to have variable classroom performance.

Encouraging signs of strong internal consistency (reliability) of most categories

The results of the preliminary investigation into the TCQ's usefulness are largely affirming in relation to internal consistency. Using Cronbach's alpha, I found that most categories are above the level of good internal reliability with two, Perceptual and Motor Control, having lower results between .60 and .70.

Significant and strong correlations between a number of the TCQ categories

Analysis of the correlations between the nine TCQ categories, using Spearman's Rank Order Correlation *H*, indicate robust correlations in five of the categories, including the Intellectual and Creative and all Section B categories – Academic difficulties, Socio-emotional and Other behaviours. The Muscular category showed little correlation and, although appearing to be independent of the other categories, would require more items and further trialling before a true interpretation could be made. With regards to the six categories of 'strengths' in Section A it was noted previously that because these categories measure different constructs it would not be expected that they would all show strong correlations (Gagné, 2008).

Indication of importance of results

Effect sizes (including correlational figures from Spearman's Rank Order Correlation), indicate the importance and relevance of a number of the TCQ findings for the sample, as an additional consideration to the generally sound significance levels.

Triangulated approach using "multiple methods" (Wilson, 2006, p. 46) for collecting and analysing data supports a credible assessment tool

Combined qualitative and quantitative measures, including teacher involvement in the development of the TCQ, and multiple analytical procedures, were included because of the need for triangulation to establish more credibility (Mills, 2011). Credibility is considered to be akin to qualitative validity (Creswell, 2009). These measures are integral to early considerations of qualitative and quantitative validity and reliability (Creswell, 2009).

Usage can support justification for further investigation of possible 2e

The TCQ shows usefulness in achieving its purpose of being a preliminary assessment tool to detect possible 2e children. Based on the findings of the TCQT, Groups 1 and 2 tended to show greater strengths in the Section A Mental strengths categories, particularly in the Intellectual and Social. However, in the Section B categories of learning difficulties Groups 2 and 3 were ranked significantly higher than Group 1 in the Socio-emotional category in particular, suggesting that further investigation may be warranted. A further point of relevance to teachers is that the tool has possibility to be used for children of mixed abilities and learning needs.

Practical usefulness

The individual teacher responses in the open sections of the TCQ demonstrate its practical usefulness. Teacher responses noted strengths in Section A particularly in specific subject areas and child subjects' personal qualities. In Section B the most identified areas were personal/confidence needs and particular behaviours. The TCQ shows promise of being a user-friendly tool including ease of scoring based on a six-point Likert scale.

Positive teacher reflection

Teacher reflections following the TCQT support the usefulness of the TCQ.

10.1.1.3. Caveats associated with the TCQ

There are caveats/limitations associated with the development and usage of the TCQ, which are summarised below and then used to form the basis of recommendations for further research/usage.

Small sample size and one study site

The main limitation is that the sample size of eight full-time and two job-share teacher respondents and 24 child subjects was relatively small. However, it is noted that all teachers invited to trial the TCQ in Years 2 to 6, participated and provided the foundation for future trialling.

Limited scope to conduct a full pilot

Due to time restraints it was only possible for the teacher focus-group to conduct a preliminary check of the TCQ in terms of the clarity of its items for teacher usage. However, data from the trial of the TCQ were analysed thoroughly as a basis for future trialling.

Inevitability of varied patterns of TCQ results?

It could be argued that the findings of the TCQT may seem to be inevitable, because it is very likely that children with strengths and needs will be detected by a checklist questionnaire that was designed for this purpose. This possible reservation is countered by the fact that none of the children was diagnosed as 2e, but rather all were selected because they had standardised test results and/or teacher perspectives that justified their inclusion to determine what traits may be evident and to what degree of ranked observation.

The same teachers involved in selecting and ranking of the child subjects

The class teachers were consulted about the selection of child subjects and then ranked the same children using the PTQ. Consequently the results may have been in part a self-fulfilling prophecy where a teacher's belief about a child's capabilities "can lead to its own fulfillment" (Jussim, 2012, p. 6). However, for the exploratory Study it was necessary to include teachers as both contributors to the nomination of child subjects and then as raters in the trialling of the TCQ. As aforementioned, standardised test results also

influenced the children's selection, and the items in the TCQ covered a diverse range of possible traits that teachers had not seen prior to the ranking process.

Multicollinearity and few items in several categories

There is scope to streamline the TCQ by reducing the number of items where there may be multicollinearity (Cooksey, 2007; Pallant, 2013), particularly the Section A category of Intellectual and the Section B categories. In conjunction, the categories of Motor control, Fine motor and Social could include more items.

Limited time for teachers to reflect and complete the questionnaire

Completing the questionnaire was limited to the allocated time release available for each teacher, which did not provide ideal reflection time.

Problem of children who may have escaped detection on the TCQ

With the complex nature of 2e, it is possible that if any of the children were 2e they may have had traits that were not observable to their teachers.

Limited scope for teachers to include their appraisal of the suitability of the TCQ

The teachers spontaneously provided insights regarding the TCQ, but it may have been beneficial to have included a section in the questionnaire for their responses about the suitability of the tool.

Issues of teacher education and bias

Although there was a detailed introduction to the trial, including discussion about the diverse traits of 2e, there may have been limitations affecting teachers' perceptions such as variations in teacher education in giftedness and learning difficulties, as well as experience in recognising possible traits. As with all survey instruments, there was the possibility of personal bias (Mills, 2011), which may have influenced some results. In addition, it cannot be discounted that if any child subjects were perceived to have a higher ranking of learning difficulties, there may have been instances of teacher reservation about indicating these perceptions due to preference for more positive scoring (Glock & Kovacs, 2013). The problem of subjectivity (Babbie, 2011) and individual differences amongst teachers was highlighted by some variations in job-share teacher ratings of the same child.

10.1.1.4. The question of the relevance of the three nominal trialling groups

Placing the 24 child participants in three nominal groups was useful in determining the functionality of the TCQ. Group 1 consisted of children with at least one high result in a standardised test but with no noted difficulties. The findings supported the inclusion of this group as a quasi-control group (Ziegler et al., 2010) for comparison to Group 2 who were noted to have a high-standardised test result but there may have been learning difficulties. Predictably both groups indicated strengths in the Intellectual and Social, but as indicated Group 2 showed significantly higher needs in the category of social-emotional difficulties which was parallel to Group 3 – the children whose true ability was uncertain. In the Case studies, two of the child subjects were in Group 2 whereas four children were in Group 3. From the results it is possible that children in Groups 2 and 3 may warrant further investigation for 2e.

The key limitation with the nominal groups was their small size – between 7 and 9 participants. I would have liked a greater sample size in Group 3 but several candidates for the group did not return their consent documentation in time for the trialling. Whilst larger sample sizes are desirable, trends observed in this exploratory Study suggest the structure of the groups had value. Recommendations for composition of future trialling groups are reviewed in the following section.

10.1.1.5. Recommendations and implications for further trialling

The caveats noted above give rise to implications for further trialling of the TCQ. It would be ideal for the next trial to focus on a range of city and regional schools including varying socio-economic settings. For comparison purposes, there would be an advantage in incorporating a group of formally identified gifted child subjects as a control group, as well as other groups consisting of formally identified 2e, and non-formally assessed very able students whom the particular school felt had possible potential and learning difficulties. There are selective classes subject to rigorous entrance requirements in some public primary schools in New South Wales, which offer gifted and talented children appropriate curriculum modification, so these schools would warrant inclusion in further trialling. In addition to acquiring a greater range of data, the wider investigation would also strengthen the TCQ's credibility and quantitative validity and reliability.

After further trialling of the TCQ, it would be recommended that items in the categories undergo further scrutiny. The possibility of multicollinearity in the categories mentioned above would suggest that there is room for further streamlining of the TCQ to ensure greater efficiency. This process, with sufficient data, would be supported by factor analysis.

Furthermore, categories such as Social, Muscular and Motor control may warrant further research to determine further possible items that may reflect the constructs more comprehensively. However, as the TCQ is designed to be used in a primary school with the main curriculum emphasis on the Mental categories of Intellectual and Creative, and the three associated categories of learning difficulties, I suggest that the TCQ remain largely intact. The Perceptual category items would benefit from a further review of their representativeness in light of Gagné's acknowledgement that this domain is the least researched of his DMGT 2.0 (Gagné, September 7th, 2013). This review of the items may create concern that the TCQ could become unmanageable in terms of the number of items and completion time. The likelihood of this limitation occurring would be minimal, because any additions would be balanced by categories that may lose any superfluous items.

Prior to further trialling, I would also recommend teacher access to a staff presentation/in-service about the TCQ with focus on the possible traits of 2e. This inclusion was valuable in the Study. Within the confines of busy school time-tables, it would be ideal for teachers to have the questionnaire for a longer period of time to allow for more reflection and observations. In fact, if the tool were to be used for investigating multiple abilities in the classroom, it would be advantageous to introduce it towards the end of Term One/first semester for collation at a later specified time. A suggested pro forma, Checklist Questionnaire – proposed master summary page, for summating the children's results is included in Appendix 27, but would benefit from teacher appraisal to determine its suitability.

To conclude, the TCQ has potential to be used by primary school teachers in their initial investigation into the strengths and learning difficulties of possible 2e children. The other assessment strategies are reviewed in the following section, apropos of complementing the TCQ in gaining a more comprehensive understanding of each child.

10.2. The search for strategies to support the TCQ via Case studies

The Case studies were invaluable to the Study showing that multiple assessment strategies can support and/or question the TCQ and, in the process, affirm the desirability for a comprehensive assessment protocol when assessing the complex range of characteristics of possible 2e children. The Phase Two focus question and relevant chapters detailing the mixed methods for data collection and analyses are listed as follows:

Phase Two: *To what extent can the Checklist be supported by other assessment strategies?*

Chapter 7 Phase Two: Case studies — Research Methods included:

- procedures of data collection and analyses involving four assessment strategies – interviews with each child, Think-aloud protocol, the Raven's Standard Progressive Matrices (RSPM) and a Parent/Teacher Questionnaire (PTQ).

Chapter 8 Phase Two: Case studies — Results and discussion focused on:

- Interviews with child participants and Think-aloud protocol.

Chapter 9: Phase Two — Results and discussion centred on two other strategies:

- RSPM and PTQ.

The following section outlines the key findings of the Case-study strategies followed by limitations and recommendations.

10.2.1. Case studies – Summary of key findings in relation to their supportiveness of the TCQ

The Case-study strategies provided varying levels of support of the TCQ results and complemented the TCQ as shown in the following section.

10.2.1.1. Interview with child participants and pre-Think-aloud interview

Confirmation of listening to the student voice

The Interview sessions confirmed the importance of listening to the student voice in terms of gaining insights about perceived strengths and possible learning difficulties. Various interests that can be a feature of children with high ability were mentioned, as well as

areas of challenge including abstract word decoding, comprehension, and implications of issues in visual processing, concentration and memory.

10.2.1.2. The non-verbal intelligence test – Raven's Standard Progressive Matrices (RSPM)

Several RSPM results confirmed the TCQ intellectual ranking

Two child participants (one from Group 2 and the other Group 3) had RSPM results above the 75th percentile in intellectual capacity, paralleling their strong intellectual ranking in the TCQ. Another two from Group 3 were average in the RSPM, with one achieving generally a non-remarkable intellectual ranking score in the TCQ, and the other a mixed perspective by his two job-share teachers.

Indications that problem-solving strengths were not always observed in the TCQ

There were instances where the children's results tended to show more problem-solving capability than detected in the TCQ Intellectual category, and in one case than indicated by standardised test results. Whilst RSPM results are not necessarily a reflection of school performance (Mills et al., 1993), it was noted that one child (Group 3) achieved above-average ranking in his RSPM result, and in the Intellectually superior range a few years earlier, which contrasted to his TCQ intellectual ranking. The remaining child (Group 2) scored a very high result in the RSPM, consistent with an earlier test, but was not consistently scored highly in the Intellectual category of the TCQ.

10.2.1.3. The Parent/Teacher Questionnaire

Parent and teacher views were similar in all categories

Overall, in all categories of the PTQ, parents and teachers appeared to be viewing the children similarly in terms of mean scores.

Similarities and differences in the PTQ sub-scale reliability support the importance of involving parents in the investigation process

There were similarities noted between parents and teachers, including the two job-share teachers in Potential and Intrapersonal sub-scales. However, differences were noted between Cognitive style and particularly Achievement, with teachers scoring higher

results, but in the Interpersonal category it was the parents indicating a stronger score. These findings highlight the importance of parent consultation, particularly with their different experience base of the home or out-of-school environment.

Insights into categories not included in the TCQ

Data from the PTQ, particularly the sub-scales Cognitive style and Intra-personal traits could provide further insights for the initial identification process.

10.2.1.4. The Think-aloud assessment

The Think-aloud protocol provided insights into reading skills and behaviours, critical-thinking skills and metacognitive abilities.

The Section B frame of the Adaptive Think-aloud Framework (ATAF) assessing Knowledge of Cognition and Regulation of Cognition, revealed a range of critical-thinking skills and metacognitive abilities in both Groups 2 and 3 that did not always match the Intellectual category of the TCQ.

Section A of the ATAF indicated a range of phonological skills which tended to support the children's own perceptions.

There were instances of difficulties in phonological skills that tended to reflect the children's self-report (Groups 2 and 3) and added more to insights gained from the TCQ The use of the TA as an online assessment tool was advantageous and complemented the TCQ.

10.2.2. Limitations arising from the Phase Two strategies

An unequal representation of students from the four year levels in the Case studies

For comparison purposes it would have been ideal to have had a more equal distribution of participants from the four year levels. However, the child participants met the criteria for selection. The presence of siblings was noted as a possible limitation but the results did not indicate similarities other than the identical twins having possible but different visual processing issues.

Interviews/self-report

Bias can influence the interviewer's type of questions and children's self-report can be influenced by confidence level (Veenman & Spaans, 2005), personality and test shyness (Crozier & Hostettler, 2003).

RSPM

One of the children who was absent during the first RSPM test completed the test in a room with unavoidable outside distractions. While these conditions were a possible limitation, the child did not appear to be affected.

PTQ

Even though the research study was exploratory, it would have been ideal to have organised a preliminary practice trial just to ensure clarity of both the format of the questionnaire and the wording of the items, as was done with the TCQ. The guideline page does provide respondents with a practice sample, and I was available for any enquiries but even so, further refinement may have ensued from an initial trial. As cited above, survey instruments such as the PTQ visual analogue scale and the TCQ Likert-type scale are subjective and could be influenced by the child's performance and behaviour on the day. It is also possible that with the visual analogue scale (PTQ) there may have been instances of teacher/parent aversion to extreme ratings, known as "end-aversion bias" (Cowley & Youngblood, 2009, p. 1884).

Using Cronbach's alpha for a small sample of six could lead to inflated or depressed results if there were any unusual scores (Pallant, 2013). There were instances of markedly different scores by one of the job-share teachers, which influenced the overall measure of internal consistency and was a reminder that even though I was looking for indications of early trends from analysis of the first trial of the PTQ, the small sample size was a limitation.

Think-aloud protocol

A limitation with the TA assessment is that I interviewed and assessed each of the participants without access to an independent auditor to check and/or verify my analyses. However, the development of the procedure and the ATAF format was the major focus of

this assessment strategy. Now that the procedure and format are established a further trial would involve member checking and an auditor review.

The main limitation I experienced in implementing the TA was the fact that because there is no one recommended TA procedure, there was a temptation to follow the standard reciprocal reading procedure seen typically in primary school English groups, of discussing text at a level that would progressively lead the children into developing more advanced skills. I found the need to be very specific about the procedure, and to know when to question or encourage and when to remain silent as an active listener. This requirement needed close monitoring because there could be the tendency for children to respond to cueing for particular types of responses (Ward & Traweek, 1993), rather than responding spontaneously.

Furthermore, whilst the TA protocol was a worthy addition to the assessment strategies, the interpretation of the children's responses is to some extent subjective and specific to the TA session/s. Consequently insights gained about critical-thinking and metacognitive abilities cannot be definitive, even though at times the results can appear very convincing.

Another limitation is that the TA's focus on verbalising insights may not be suitable for all children particularly where the child:

- may be reserved about talking about reading, or only used to giving limited responses (Ward & Traweek, 1993);
- has insight into the text, but does not necessarily articulate or may not feel confident articulating the thinking process (Merchie & Van Keer, 2014; Veenman, 2011; Whitebread et al., 2009); or
- experiences a learning difficulty, such as a working memory (WM) deficit whereby integrating reading and articulation of strategies may be challenging (Fugate et al., 2013).

10.2.3. Recommendations arising from the use of the four strategies

Interviews and RSPM

Allowing for possible limitations aforementioned, the interviews and the RSPM were both useful strategies. Prior to using both assessment instruments with children, it is

recommended that time be spent in familiarising them with the procedures and the purpose. To be withdrawn from class routine and to be exposed to testing is somewhat of an artificial situation (Babbie, 2011), so I found this preliminary preparation to be invaluable in helping the children to feel at ease with the procedures.

PTQ

The PTQ has potential as a tool, but would require further trialling to determine the suitability of all categories and items. Furthermore, to explore teacher consistency as a factor in reviewing the validity of the TCQ, the Intellectual category results could be compared to the similar PTQ construct of Potential. The scales are different, but preliminary results shown in Appendix 36, where the TCQ results are converted to a score out of 100, indicate comparability.

Think- aloud protocol

Ideally the children would have benefited from more exposure to this approach prior to the assessment. Although, as indicated, they were familiar with reciprocal reading, the emphasis on articulating strategies to make sense of text required more individual focus and application when using the Think-aloud protocol. Furthermore, the ATAF Section B frame is time-consuming to complete and development of a simpler pro forma for future teacher usage would be advantageous.

10.2.4. Recommended research into areas of specific needs

The Case studies raised questions about possible issues connected to visual processing, sensory integration, working memory (WM) and comprehension difficulties. Research into the following areas would be relevant to further identification/understanding of specific traits of 2e:

1. investigation of assessment strategies for detecting working memory, or visual processing issues in relation to reading proficiency, including articulation of verbal comprehension; and
2. investigation of compensation strategies in a longitudinal study. Identical twins in the Study may have varying degrees of visual processing issues and seem to have developed effective compensation strategies. It would be valuable to determine if

these strategies are sufficient for secondary school education and to also explore external interventions.

10.2.5. Implications for practice in the primary school arising from the TCQ and Case-study strategies

In their already full curriculum, pre-service teacher education institutions need to maintain or enhance focus on procedures for identifying underachievement, as well as practical strategies to assist teachers to best manage multiple abilities in the classroom, including 2e. Theoretical knowledge alone is insufficient and needs to be combined with modelling of best practice by skilled educators.

It would also be highly recommended that parents are invited to share perceptions about their child's strengths and learning difficulties and, where practicable, to be kept informed of school investigations. This parent, teacher and/or carer combination ideally would support the initial identification process, subject to circumstances.

The question arises from this Study about the nature of intervention if early investigations suggest high ability and learning difficulties or disabilities. Depending on the context of the school and available resources, specialist assessment and/or the support of learning support staff would be advantageous. Whilst I am mindful of the complex, diverse, and at times confronting behavioural and learning needs that can accompany 2e, the goal of identification and reviewing appropriate learning opportunities remains a necessity.

10.3. Conclusion

In society there are notable individuals who by some extraordinary feat of the human spirit, including drive and tenacity, mount the heights and in the process overcome a range of challenges. However, for many children there needs to be another hand to help open a door in their primary school years, that not only allows potential to 'reach for the surface', but helps to engender a reason, a passion for committing to the extra effort to overcome and actualise, not only for self but for a world that sorely needs their inspiration. I conclude this thesis with an adaptation of the well-known verse by E. E. Cummings cited at the beginning of this chapter. This version was written by a 10-year-old girl who was, and still is, passionate about Shakespeare and creates the most extraordinary writing, but Mathematics — well, that was another story. Her beautiful and profound adaptation is

relevant to 2e children and all children, and reminds and urges us as educators to examine our role and responsibility in finding ways to open the doors of possibility. Her words ring true: “And remember, always know you are valuable, worth listening to, worthy of trust and sacred and if you forget I will always remind you...” (O. Inwood, personal communication, December, 2011).

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Appendices

Appendix 1. Teacher Questionnaire: Perceptions about children who may be gifted with a learning difficulty (Teacher Perceptions Questionnaire TPQ)

This questionnaire is part of a study to develop a fuller understanding of the characteristics of gifted children with learning difficulties. Your perceptions will be very helpful as a starting point for increasing awareness and identification of these children.

Personal details: This section provides important information for analysis purposes. You do not need to record your name and if the results are used in any publication, a pseudonym will be used.

Please circle the appropriate response(s)

1) The number of years that you have been teaching/working with primary school children
- four years or less
- five to ten years
- eleven years or more

2) Training in working with gifted children
- professional development (including external and on-site)
- part of curriculum as a pre-service teacher
- specific tertiary course
- none

3) Training in working with children with learning difficulties
- professional development (including external and on-site)
- part of curriculum as a pre-service teacher
- specific tertiary course
- none

4) Any comments that you wish to add about your training/experience

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A scenario for you to read and imagine

A child is starting in your class today and her previous teacher has reported that she has learning difficulties and yet, at times, shows a 'spark' or a knowledge that seems to be well ahead of her achievement level. From her report, she presents as an enigma! Is it possible though, that this student could be highly capable, as well as having challenges with her learning?

You may or may not have taught/supported a similar child. Reflect on the characteristics that you have noticed about this child, or may expect to notice.

***Please indicate the possible characteristics that you may have noticed or may anticipate*:**

Strengths (e.g., academic achievement, thinking skills, vocabulary, imagination, physical coordination, etc.)

-
-

Learning Difficulties (e.g., handwriting, spelling, etc.)

-
-

Work application (e.g., level of focus on set task, completion of activities, homework, etc.)

-
-

Achievement on standardised tests (e.g., level, consistency of achievement, etc.)

-
-

Talking and listening skills (e.g., listening and participating in class discussions, following spoken instructions, etc.)

-
-

Emotional indicators (e.g., self-esteem, social needs, sensitivities, frustration, excitability, etc.)

-
-

Other possible characteristics

-
-

***Please circle the number of possible GLD children that you may have taught or supported*.**

One child Several children More than three Non applicable

***Do they all share similar characteristics to those that you have noted in this questionnaire*?**

Yes no Non applicable

If you have taught or supported more than one GLD child and, if their characteristics are different, please explain briefly.

Optional

Other comments that you may wish to make:-
(for example, your perceptions about the suitability of the term 'gifted')

Appendix 2. Teacher Checklist Questionnaire for use by teachers in the primary school

Important background for the teacher

This Checklist is an assessment tool for use in the preliminary stage of identifying children whom you suspect may have 'significant learning potential' or 'gifted potential' and/or may have one or more 'learning difficulties'.

Learning difficulties can affect all areas of children's learning, but mostly in one or more of the following:-

Literacy (talking and listening, handwriting co-ordination, written expression, reading and reading comprehension)

Numeracy (recall of knowledge from memory, understanding and processing concepts, application)

Executive functioning (organising, planning, strategising, focusing attention, remembering and self-regulating)

Does the Checklist have a strong evidence based foundation?

In **Section A ('Indicators of significant learning potential')** the categories are based on Gagné's Differentiated Model of Giftedness and Talent 2.0 (update 2008). In this Model there are specific Domains/categories, which represent the fields where there can be high to very advanced/ 'gifted' potential. The Domains are:–

Mental – 'Intellectual', 'Creative', 'Social' and 'Perceptual'

Physical – 'Muscular' and 'Motor Control'

In **Section B ('Indicators of possible learning difficulties')** the categories used in the Checklist are:-

'Academic difficulties', 'Socio-emotional' and 'Other behaviours'.

The categories used in Section B are relevant because they reflect the key areas that children in schools can have learning difficulties.

(The items used in each category are based on available literature – including Potential Plus, UK (2014–2017); Bees, (1998); Montgomery (2009); Nielson (2002); Rogers (2012)

Is it a diagnostic tool?

It should be noted that this Checklist is not designed for diagnostic purposes, but rather as a guide.

Recommendations if the checklist indicates that the child may have 'significant learning potential' and/or a 'learning difficulty

The Checklist may give an indication that further assessment may be advisable to determine more about the child's 'significant learning potential' and/or 'learning difficulty'. A review with the school's learning support staff and parents would be advised if the teacher felt that there was a significant number of 'Often' and 'Always' responses showing in one or more of the 'significant potential' categories (Section A) and/or significant indications of 'needs' in the 'learning difficulties' (Section B).

Intervention?

The review process of the child may then require further specialised assessment. The outcome of the Checklist findings may necessitate specific educational intervention through curriculum modification and, or learning support, to further the child's learning opportunities.

DRAFT FOR TRIALLING

Teacher……..... Child…….. Year level…….. Date……..

Place a mark in the appropriate box to indicate how frequently that you have observed the characteristic or trait in the child that you are reviewing. Where there are a significant number of characteristics being ranked as Often or Always then the respondent would be advised to consult with the School's leadership team, learning support staff and parents.

The rating is Not applicable, Not observed, Uncertain, Sometimes, Often, Always

SECTION A: INDICATORS OF POSSIBLE SIGNIFICANT LEARNING POTENTIAL

MENTAL DOMAINS/CATEGORIES (Intellectual, Creative, Social, perceptual)

SECTION A	Not applicable	Not observed	Uncertain	Sometimes	Often	Always
INTELLECTUAL						
1 Achieves a high score in one or more components of an ability test or in a school standardised test, e.g., IQ assessment, PAT Mathematics, TORCH comprehension, NAPLAN, etc.						
2 Excels at tasks requiring abstract thinking and problem solving						
3 Learns new concepts quickly and easily						
4 Has natural flair in science and or 'space and geometry' in mathematics						
5 Shows very high ability/skill in one or more areas (not necessarily in the school context)						
6 Asks in-depth and challenging questions						
7 Reveals an in-depth knowledge of an area of high interest						
8 Uses an extensive and advanced vocabulary						
9 Shows advanced reasoning skills in responses to difficult questions						
10 Grasps concepts all at once rather than step by step, e.g., is able to 'get it' without the usual developmental steps						

SECTION A	Not applicable	Not observed	Uncertain	Sometimes	Often	Always
INTELLECTUAL						
11 Comprehends very easily, e.g., quick understanding of explanations, or excels in making deductions						
12 Shows advanced insights about complex topics						
13 Excels in puzzles and mazes						
14 Has excellent visual memory, e.g., advanced sight word recognition and/or spelling of complex words						
Other observations/comments						
CREATIVE						
1 Shows a very active and distinctive imagination						
2 Shows a very high level of creativity						
3 Is highly inventive and original						
4 Reveals a very keen sense of humour – often quirky or even bizarre						
5 Shows very high ability in one or more of the creative arts, e.g., music, drama, visual arts						
Other observations/comments						
SOCIAL						
1 Is recognised for leadership skills e.g., by teachers or peers						
2 Reveals a very persuasive and convincing manner						
3 Has a heightened awareness of the needs of others						
Other observations/comments						

SECTION A	Not applicable	Not observed	Uncertain	Sometimes	Often	Always
PERCEPTUAL						
1 Is extremely sensitive to sound variations						
2 Reveals a keen awareness of fine visual detail						
3 Shows an advanced visual spatial awareness, e.g., flair in 'judging' and performing physical movements such as in gymnastics, 'passes' in ball games, marked ability in dancing						
4 Experiences a marked sensitivity to certain tastes and or food textures						
5 Has an acute sense of smell						
6 Reveals an in-depth level of perception, e.g., seems to be able to tap into a deeper level of wisdom or inspiration						
Other observations/comments						

PHYSICAL DOMAINS/CATEGORIES

SECTION A	Not applicable	Not observed	Uncertain	Sometimes	Often	Always
MUSCULAR						
1 Has exceptional physical endurance, e.g., rarely tires						
2 Excels in gross motor activities, e.g., athletics, basketball, gymnastics						
Other observations/comments						
MOTOR CONTROL (fine motor and reflexes)						
1 Has great skills and quick reflexes in computer games						
2 Draws with precision						
3 Has excellent manual dexterity, e.g., competency in computer keyboard skills						
Other observations/comments						

SECTION B: INDICATORS OF POSSIBLE LEARNING DIFFICULTIES

CATEGORIES OF LEARNING DIFFICULTIES

SECTION B	Not applicable	Not observed	Uncertain	Sometimes	Often	Always
ACADEMIC DIFFICULTIES						
1 Experiences difficulty in articulating thoughts or at times 'getting to the point'						
2 Finds abstract verbal information difficult to remember and comprehend						
3 Shows a discrepancy between listening comprehension and reading comprehension						
4 Experiences difficulties with the mechanics of reading, e.g., tracking, word decoding, fluency						
5 Experiences challenges with reading comprehension						
6 Shows a significant gap between verbal ability and written skills						
7 Reveals a discrepancy between written work and potential						
8 Has difficulty in writing at the level expected						
9 Takes considerable time to actually write						
10 Takes considerable time to respond verbally						
11 Has spelling difficulties						
12 Experiences difficulty with phonics						
13 Has handwriting coordination difficulties or problems completing paper and pencil tasks						
14 Shows uneven academic skills, e.g., varying results in class						
15 Has difficulty remembering number facts						
16 Experiences difficulty understanding mathematical concepts and problem solving						
17 Can experience difficulty in completing school work, e.g., may not follow a task through to its completion						
18 Can experience challenges with doing simple tasks, yet						

SECTION B	Not applicable	Not observed	Uncertain	Sometimes	Often	Always
ACADEMIC DIFFICULTIES						
proficiency in doing more complex ones						
19 Has difficulty completing tasks with a sequence of steps						
20 Shows diminished work performance under time pressure						
21 Has difficulty remaining focused during more cognitively challenging tasks, but attends well when there is less cognitive demand						
22 Experiences challenges with concentration, e.g., difficulty remaining on task						
23 Reveals challenges with listening skills						
24 Can be easily distracted						
25 Experiences challenges with short term or long term memory						
26 Experiences difficulty in remembering and following verbal directions						
Other observations/comments e.g., speech difficulties; early childhood ear difficulties (grommets?);visual tracking issues; English as a Second Language						
SOCIO-EMOTIONAL						
1 Experiences persistent dissatisfaction with achievements						
2 Has feelings of academic inadequacy						
3 Avoids trying new activities						
4 Experiences intense frustration						
5 Is very sensitive to criticism						
6 Reveals a fluctuating level of self-esteem and confidence						
7 Can experience a high level of anxiety						
8 Worries frequently about losing things, or other concerning issues						
9 Fluctuates emotionally						
10 Experiences challenges with social skills						
11 Can be somewhat isolated from peers						
12 Sets unrealistically high or low self–expectations						

SECTION B	Not applicable	Not observed	Uncertain	Sometimes	Often	Always
SOCIO-EMOTIONAL						
13 Finds working in groups difficult						
14 Can be withdrawn						
Other observations/comments						
OTHER BEHAVIOURS						
1 At times may show overly physical behaviours						
2 Experiences problems with organisation, e.g., managing time and work space						
3 Has fine motor/coordination issues, e.g., low muscle tone affecting posture in sitting, drawing and handwriting						
4 Prone to bumping into things or misjudging where things are						
5 Fatigues easily with reading						
6 Can appear unmotivated						
7 Can show an indifferent attitude about school or lack of engagement with school work						
8 Can be impulsive, e.g., interrupting, making physical contact						
9 Can be hyperactive						
10 Can have behavioural issues at school						
11 Experiences frustrations from being a perfectionist						
12 Is skilled in making excuses to avoid difficult tasks, e.g., requests for drinks						
13 Can becomes unsettled with a change of routine						

SECTION B	Not applicable	Not observed	Uncertain	Sometimes	Often	Always
OTHER BEHAVIOURS						
14 Prone to repetitive behaviours patterns, e.g., fidgeting, rocking						
15 Prefers solitary activities						
Other observations/comments						

Appendix 3. Parent/Teacher Questionnaire (PTQ)

PARENT/TEACHER QUESTIONNAIRE

This questionnaire is part of a study designed to learn more about children's potential and their learning characteristics. Your participation is appreciated. There is an 'optional section' at the end of the Parent/Teacher Questionnaire for any comments that you may like to record. Would you begin by please providing some important details.

Circle your relationship to the child: Parent or Teacher

Child's name……
(Confidentiality is ensured in all published documents)

Age……..School ……..Year level ……

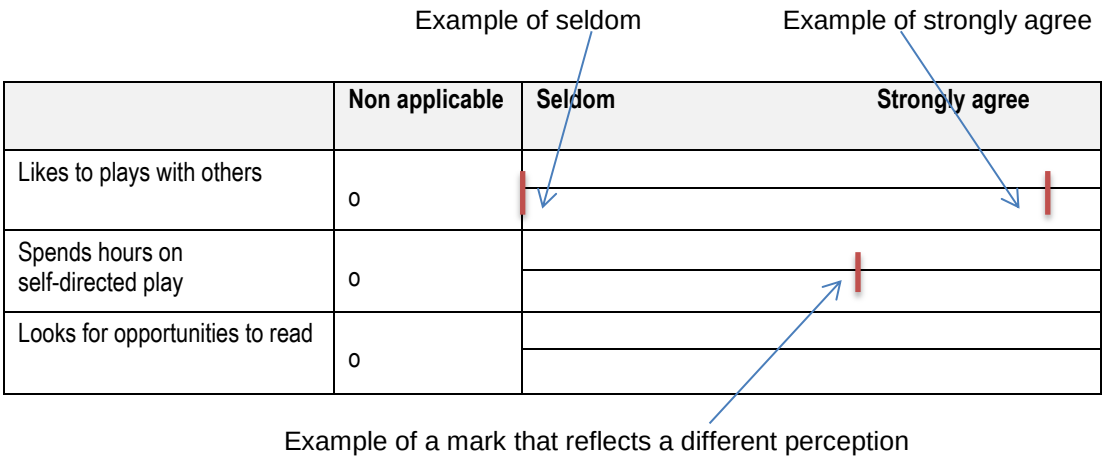
Date…….

The actual questionnaire

You are invited to give your perception about each statement. You could place a mark on the line at 'Seldom' or 'Strongly agree' or somewhere between both points to show where your view would fit on the continuous line. Respond quickly so that you are giving a response to show your perception at this point of time. There is a practice section to familiarise yourself with the technique. If at any time you feel that your response would be 'non applicable' please mark the circle in the designated section. Thank you.

Practice sample (please use a pen or a sharp pencil)

Recreation outside of school



PARENT/TEACHER QUESTIONNAIRE

Questionnaire perceptions can be based on your observations at home or school

Potential	N/A	Seldom Strongly agree
1 Learns new concepts very easily	o	
2 Has a high level of talent in at least one area	o	
3 Shows real enthusiasm for learning and exploring things in depth	o	
4 Has an in-depth knowledge of an area of high interest	o	
5 Has verbal communication skills beyond his/her years	o	
6 Has strong reasoning and problem solving skills	o	
7 Asks in-depth and challenging questions	o	
8 Is highly creative	o	
Cognitive style	**N/A**	**Seldom Strongly agree**
1 Prefers to learn step-by-step	o	
2 Grasps the 'big picture' instead of learning step by step	o	
3 Remembers verbal information easily	o	
4 Prefers to see it, in order to get a better understanding	o	
5 Follows verbal instructions easily	o	
6 Has difficulty in recalling what has been finished and what still needs to be done	o	
7 Takes time to get things finished	o	
8 Can be forgetful	o	
9 Can have difficulty in planning and organising	o	
10 Sustains attention to complete a task	o	
11 Finds it challenging to remember instructions given as a sequence of steps	o	
Achievement	**N/A**	**Seldom Strongly agree**
1 Achievement results at school can vary	o	
2 Explains his/her ideas clearly	o	
3 Enjoys doing repetitive tasks e.g., the same types of homework	o	

Achievement	N/A	Seldom Strongly agree
4 Has difficulties in handwriting and presentation	o	
5 Has to be actively engaged in learning activities (at school or at home)	o	
6 Doesn't always feel motivated by school work	o	
7 Experiences challenges with reading comprehension	o	
8 Experiences challenges in mathematics	o	
9 Shows a gap between verbal ability and written expression	o	
10 Shows proficient computer skills	o	
Interpersonal relationships	**N/A**	**Seldom Strongly agree**
1 Likes plenty of time to reflect and recharge	o	
2 Is energised and 'comes to life' in the company of others	o	
3 Prefers his/her own company	o	
4 Enjoys playing with peers	o	
5 Is capable of setting up situations, or making adjustments for own advantage	o	
6 Shows leadership skills	o	
Intrapersonal relationships	**N/A**	**Seldom Strongly agree**
1 Is sensitive	o	
2 Is a perfectionist and worries about making mistakes	o	
3 Can give up on a task if frustrated		
4 Can be self-critical	o	
5 Can experience anxiousness	o	
6 Likes to work hard to achieve a goal e.g., projects, music practice, etc	o	
7 Can place an excessive demand on himself/herself through being so motivated or 'driven'	o	

Note. Highlighted items are similar to items in the Teacher Checklist Questionnaire

***Optional*:**

This section is optional and is provided in case you would like to share other perceptions, for example:

Further perceptions about your child's potential:

Factors that may impact on your child achieving his/her potential:
(for example, a perfectionist who sets 'the bar' too high)

Other comments

Appendix 4. Overview – Identification of children with possible giftedness/high ability and learning difficulties (adapted from Berman, 2013)

Content	Methodology	Purpose
1. Australian education policies: context of the research	**1. Theoretical/conceptual framework**	**1.Evaluation**
Equity and excellence in Australian schooling There is a need to "promote a culture of excellence in all schools, by supporting them to provide challenging, and stimulating learning experiences and opportunities that enable all students to explore and build on their gifts and talents" (Ministerial Council of Education Employment Training and Youth Affairs (MCEETYA), 2008, p. 7). **Gifted and talented students** "Gifted and talented students are entitled to … engaging learning opportunities … aligned with their individual learning needs, strengths, interests and goals" (Australian Curriculum Assessment and Reporting Authority, 2016b, *Gifted and talented students*). **Learning difficulties** "Students with a disability are entitled to … engaging learning opportunities drawn from age equivalent Australian Curriculum content on the same basis as students without disability" (Australian Curriculum Assessment and Reporting Authority, 2016b,*Students with disability*). **Gifted and Talented and variations in achievement** Gifted and talented students can: - "vary across high-potential students and over time, and some gifted students underachieve and experience difficulty translating their gifts into talents"; - be difficult to identify, "and their visibility can be impacted by cultural and linguistic background, gender, language and learning difficulties, socio-economic circumstance, location, and lack of engagement in curriculum that is not matched to their abilities" (ACARA, n.d.-b, *Introduction*, para. 2).	**Identification** **Definitions and issues**: Giftedness; learning difficulties/learning disabilities; gifted/high ability with learning difficulties **Obstacles**: Limited empirical research; diversity of GLD (2e); underachievement; uncertainty of IQ testing; teacher awareness/experience **Educational policies** **Identification** • Theories: Behaviourist and psychometric theories; Cognitive/constructivist theory • Components of identification questionnaire • Model of giftedness Gagné: DMGT 2.0 (2008); Gagné EMTD (2013) **Question: Phase One** ***What are the components of a comprehensive, useful checklist for the preliminary stage of identifying possible gifted children with learning difficulties?*** **Other strategies** G. **Student voice** H. **Non-verbal intelligence test** I. **Parent and teacher voice** J. **Metacognition and critical thinking** **Question: Phase Two** ***To what extent can the Checklist be supported by other strategies?***	**Policy goals** To determine strategies that best assist in:- - "Understanding each child's current knowledge, skills, attitudes and dispositions (Element 1.1.2)" (Fleet & Patterson, 2012, p. 34). - "Guiding pedagogical decisions" (Element 1.1.5) (Fleet & Patterson, p. 34). - "Enriching professional practice (Element 1.2.3)" (Fleet & Patterson, p. 34). - "Maximising opportunities for learning (Element 1.1.3)" (Fleet & Patterson, p. 34). **Study's rationale** -To determine the attributes of gifted children with learning difficulties (GLD) (2e); -To develop and implement an initial comprehensive, useful identification checklist for primary school teachers; -To determine other strategies for a comprehensive assessment protocol; -To provide the basis for future development and trialling of assessment strategies to identify GLD (2e) children; -To gain insight into specific needs and implications for intervention; and -To establish a clear understanding based on an evidence-based foundation.

Content	Methodology	Purpose
2. Concepts/terminology	**2. Research methodology**	**2. Evaluation**
Key concepts Identification; giftedness; Learning disabilities; GLD; DME; Twice-exceptionality; Underachievement; Specific learning difficulties; Autism Spectrum Disorder; Attention Deficit Disorder; Attention Deficit Hyperactivity Disorder; Emotional behavioural disorder; Metacognition and Critical thinking **KEY WORDS** Attention Deficit Disorder; Attention Deficit Hyperactivity Disorder; Autism Spectrum Disorder; Dual and Multiple Exceptionality; Emotional Behavioural Disorder; Giftedness, Gifted learning disabilities; Learning Disability; Specific Learning Difficulties; Twice-exceptionality; Underachievement; Working memory	**Mixed Methods Research** via **Participatory Action Research** and **Case studies** **Theoretical framework** Interpretivist/constructivist and Transformative theories; Critical theory and the paradigms of praxis and pragmatism **Philosophies** Social cognition theory (Bandura, 1991) Theory of pragmatism (Morgan, 2014)	**Goals of MMR methodology** Triangulation of data
3. Context and relationships	**3. Research methods**	**3. Specific goals**
- More empirical evidence is necessary in establishing characteristics and effective identification strategies. - Giftedness together with learning difficulties can be 'masked'. -There is need for greater teacher awareness of the existence of gifted children with learning difficulties - There are gifted children who have learning difficulties and are underserved. - Significant issues centre on underachievement. - Parents have valuable insights into their child's learning needs	***Phase One*:** *What are the components of a comprehensive, useful checklist for the initial identification of gifted/high-ability children with learning difficulties*? **Participants:** **Teacher participants**: Teacher Perceptions Questionnaire, Staff meeting presentation, and Teacher focus-group for development of Teacher Checklist Questionnaire **Child subjects:** selected from Years 2 to 6 **Data collection:** 1. Review literature for GLD (2e) traits 2. Teacher Perceptions Questionnaire 3. Staff meeting presentation focuses on aim of the study, characteristics of GLD (2e) children and reviews whether there are children who may be 'hidden' GLD (2e) 4. Teacher focus-group including researcher develop the TCQ 5. Trialling Checklist **Data analysis**: 1.Content analysis 2.Descriptive and inferential statistics	Teachers involved in Phase One for enhancing and sharing insights about GLD (2e) via reflection and dialogue. Qualitative validity: Independent teachers (not involved directly with Study) assisted with inter-rater reliability of data analysis. Qualitative analyses for analysing Teacher Perceptions Questionnaire for main themes and open-ended responses and using descriptive statistics to describe the samples and scores. Reliability of TCQ utilises Cronbach's Alpha, and inferential statistics to determine usefulness of TCQ.

Content	Methodology	Purpose
3. Context and relationships	**3. Research methods**	**3. Specific goals**
	Phase Two*: To what extent can the Checklist be supported by other assessment strategies?* **Participants**: 1. Child subjects**: six children, selected from the TCQ results and teacher consultation** 2. Class teacher/s: **of each child subject** 3. Parent **of each child** **Data collection assessment procedures**: 1. Formal interview with each child participant to determine interests, perceived needs 2. Parent/Teacher Questionnaire (PTQ) 3. Raven's Standard Progressive Matrices 4. Think-aloud assessment (TA) **Considerations of validity and reliability**: - Researching literature for 2e characteristics - Accessing a range of data sources to develop a more complete understanding (triangulation) - Including parent and teacher perceptions - Checking inter-rater reliability of coding for qualitative data -Measuring internal consistency of questionnaires via Cronbach's Alpha co-efficient	Phase Two is focused on determining whether other assessment strategies support the TCQ. Strategies of Phase Two are designed to: - access insights from the student voice - compare parents and teachers' views; - compare TCQ Intellectual results to RSPM; and – use online TA assessment to access metacognitive and critical-thinking skills. These strategies provide a preliminary investigation of validity and reliability, but further testing would be required.

Appendix 5. Teacher Perceptions Questionnaire: Strengths (themes)

ID	Years of teaching	G study	L/Dif study	Numeracy	Thinking skills	Oral language	Knowledge and interests	Subject or specific area	Listening	Memory	Creativity	Leadership	Visual learner
1	≤4	Ps; Pd	Ps; Pd	All concepts 1	Logically minded 1			Sport 1					
2	≤4	N	Ps	Number facts 1				Science and technology 1; Spelling 1		Quick recall of number facts 1			
3	≤4	Ps	Ps	Numeracy results 1	Higher order 1; Connections between concepts 1			Reading comprehension 1					
4	5 to 10	Ps; Pd	Ps; Pd		Thinking outside box 1	Vocabulary 1					Imagination / creativity 1		
5	≥11	Ps; Pd; Tc	Ps; Pd		Lateral thinker 1	High 1; Expert like in area of interest 1	High level of knowledge about an area of passion 1						Visual learner 1
6	≥11	Pd	Pd		Thinking skills e.g., chess, puzzles, Lego constructions 1(cc to C)	Extensive vocabulary 1	Extensive general knowledge 1; Finding out how things work 1				Lego construction 1 (cc from Thinking skills)		
7	≥11	Pd	N		Thinking skills 1	Conversant about specific things 1	In-depth knowledge and understanding. 1	Specific areas 1			Creativity 1		
8	≥11	Pd	Pd		Thinks outside box 1	Articulate about ideas/reasoning 1;Conversation							

ID	Years of teaching	G study	L/Dif study	Numeracy	Thinking skills	Oral language	Knowledge and interests	Subject or specific area	Listening	Memory	Creativity	Leadership	Visual learner
						is of higher level 1; Verbal problem solver 1							
9	≥11	Pd	Tc		Oral comprehension 1 (cc to O.L.); Ability to present an argument 1; Higher order thinking skills 1	Extensive vocabulary 1; Oral comprehension 1 (cc from T.S.)	Broad interests 1; Current affairs 1		Very good listening skills 1				
10	5 to 10	Pd	Pd	Patterns in Mathematics 1				Certain subject areas 1		Good memory recall of topics of interest 1	Creative ideas 1	Strong sense of fair play 1	
11	≥11	Pd	Pd		Thinking skills 1; Problem solving 1	Imaginative speech 1 (cc to C)		Team sport 1; Art/craft 1 (cc from Creativity)			Speech 1 (cc from O.L.); Art/craft 1 (cc to Subject area)	Respected leader 1	
Total responses				4	13	11	6	8	1	2	6	2	1

Note. Abbreviations: G study = training in gifted education; L/Dif study = training in Learning difficulties; Ps = Pre-service training; Pd = Professional development; Tc = Tertiary course; N= none; T.S. = Thinking skills; O.L. = Oral language; C = Creativity; highlighted letters cc = cross code where a trait is relevant to another theme in the category; numeral 1 next to each item indicates a separate trait noted by the respondent in each category

Appendix 6. Teacher Perceptions Questionnaire: Learning difficulties (themes)

ID	Years of teaching	G study	L/Dif study	Specific subject areas	Handwriting/ coordination	Gross motor	Time management	Level of focus	Writing	Memory	Creativity	Organisation	Interactions
1	≤4	Ps; Pd	Ps; Pd	Punctuation 1; Grammar 1	Writing difficult to read 1						Creative tasks 1		
2	≤4	None	Ps	Maths 1						Confusion with remembering longer steps 1			
3	≤4	Ps	Ps				Time issues 1	Distractible 1	Prefers conversation to writing 1; A long time to complete work 1			Organising thoughts and ideas 1	
4	5 to 10	Ps; Pd	Ps; Pd		Messy 1			Short attention span 1					
5	≥11	Ps; Pd Tc	Ps; Pd		Poor 1	Clumsy 1						Planning work space 1; Poor self – organisation 1	Some area of social deficiency..1 (cc from O.C.)
6	≥11	Pd	Pd	Spelling 1	Handwriting 1; Presentation 1				Expressing ideas in writing 1			Disorganised 1 (cc from O.C)	
7	≥11		Pd	None									Group work challenging with peers of lesser ability 1 (e.g.,

ID	Years of teaching	G study	L/Dif study	Specific subject areas	Handwriting/ coordination	Gross motor	Time management	Level of focus	Writing	Memory	Creativity	Organisation	Interactions
													oppositional)
8	≥11	Pd	Pd		Pen/eye coordination 1; Pencil grip 1; Poor presentation 1				Transferring ideas/ concepts to paper 1				
9	≥11	Pd	Tc	Reading - decoding and fluency 1; Spelling 1 (cc from Lo F)				Inconsistent spelling errors 1 (cc to Specific Subject)	Written work brief and simple 1				
10	5 to 10	Pd	Pd	Reading – blending and decoding strategies are inconsistent 1	Untidy 1; Fine motor problems 1	Clumsy in sport 1				Working memory is sometimes compromised by information overload? 1 (cc from O.C.)			
11	≥11	Pd	Pd	Reading - eye skills, fluency 1; Maths interpreting questions 1 (cc to writing); Spelling 1					Written work in Maths 1 (cc from Specific subject)				
Total responses				10	10	2	1	3	6	2	1	4	2

Note. Abbreviations: G study = training in gifted education; L/Dif study = training in Learning difficulties; Ps = Pre-service training; Pd = Professional development; Tc = Tertiary course; N= none; cc = cross code where a trait is relevant to another theme; cc from O.C. = relevant trait taken from table 'Other characteristics'; L o F = Level of focus; Numeral 1 next to each item indicates a separate trait noted by the respondent

Appendix 7. Teacher Perceptions Questionnaire: Work application (themes)

ID	Years of teaching	G study	L/Dif study	Attention difficulties	Incomplete tasks	Work quality issues	Preference socialising instead of work	Confidence/ frustration issues	Prefers to relate to adults	Decision making
1	≤4	Ps; Pd	Ps; Pd	Lacks focus 1	Often incomplete 1	Rarely to acceptable standard 1				
2	≤4	N	Ps				Talkative and work dependent on reward 1			
3	≤4	Ps	Ps		Rarely completes or hands in work on time 1; Frequently submits incomplete work 1					
4	5 to 10	Ps; Pd	Ps; Pd	Low level of focus when not interested 1						
5	5 to 10	Ps; Pd; Tc	Ps; Pd	Hard to stay on topic unless engaging 1	Tasks rarely completed 1					
6	≥11	Pd	Pd	Trouble focusing for a period of time unless engaged 1; Slow to complete work 1	Incomplete work 1			Not a risk taker 1 (cc from O.C.)		
7	≥11	Pd	N		Non completion 1	Lower level response 1				
8	≥11	Pd	Pd	Sitting still and giving attention to writing is lacking 1			Seeks adult contact 1 (cc from Prefers relating to adults)	Seeks reassurance constantly 1	Seeks adult contact 1 (cc to PS)	
9	≥11	Pd	Tc			Only meets base level 1		Avoidance of task – 'delay tactics' 1;		Too many research options or choices can lead to 'paralysis' 1

ID	Years of teaching	G study	L/Dif study	Attention difficulties	Incomplete tasks	Work quality issues	Preference socialising instead of work	Confidence/ frustration issues	Prefers to relate to adults	Decision making
10	5 to 10	Pd	Pd	Requires repeat of instructions 1; Reminders to keep on task 1;				Learned helplessness 1; Delay tactics – avoids paper and pen tasks 1		
11	≥11	Pd	Pd		Homework issues 1			Frustrated if lack of progress 1		
Total responses				8	7	3	2	6	1	1

Note. Abbreviations: G study = training in gifted education; L/Dif study = training in Learning difficulties; Ps = Pre-service training; Pd = Professional development; Tc = Tertiary course; N= none; A.D. = Attention difficulties; PS = Prefers socialising; cc = cross code where a trait is relevant to another theme; cc from O.C. = relevant trait taken from table 'Other characteristics'; numeral 1 next to each item indicates a separate trait noted by the respondent in each category

Appendix 8. Teacher Perceptions Questionnaire: Achievement on standardised tests (themes)

ID	Years of teaching	G study	L/Dif study	Strength in at least one area	Inconsistencies	Less than average result
1	≤4	Ps; Pd	Ps; Pd	Maths 1	Average to above depending on KLA 1	
2	≤4	None	Ps		Low PAT comprehension (cc) but high PAT Maths 1	Low PAT comprehension 1 (cc from Inconsistencies)
3	≤4	Ps	Ps	Literacy 1; Numeracy 1; Advanced thinking in comprehension 1		
4	5 to 10	Ps; Pd	Ps; Pd		Surprisingly higher scores 1	
5	≥11	Ps; Pd; Tc	Ps; Pd		Surprisingly good 1; Asynchronous 1	
6	≥11	Pd	Pd	High/superior 1	Inconsistent results – can be low 1 (cc to Less than average result)	Can be low 1 (cc from Inconsistencies)
7	≥11	Pd	None		Varies with motivation and effort 1; Varies with type of test 1	
8	≥11	Pd	Pd		High level in class tests but poor standardised test results 1 (cc to Less than average result)	Poor standardised test results 1 (cc from Inconsistencies)
9	≥11	Pd	Tc		Inconsistent e.g., Mathematics versus Literacy 1; Written comprehension doesn't match oral comprehension 1; Comprehension better than many errors in 'running record' 1	
10	5 to 10	Pd	Pd		Achievement depends on comprehension of instructions 1	
11	≥11	Pd	Pd		Low scores on verbal and written tasks cc in contrast to strong results on non–verbal and oral tests when very young 1	Low scores on verbal and written tests 1 (cc from Inconsistencies)
Total responses				5	14	4

Note. Abbreviations: G study = training in gifted education; L/Dif study = training in Learning difficulties; Ps = Pre-service training; Pd = Professional development; Tc = Tertiary course; N= none; PAT = Progressive Achievement Tests; cc = cross code where a trait is relevant to another theme; numeral 1 next to each item indicates a separate trait noted by the respondent in each category

Appendix 9. Teacher Perceptions Questionnaire: Talking and listening skills (themes)

ID	Years of teaching	G study	L/Dif study	Distractible	Issues pertaining to class discussion	Possible 'irregular' listening or attention patterns
1	≤4	Ps; Pd	Ps; Pd	Constantly seeks social interaction 1; Easily distracted 1	Limited participation in class discussions 1	
2	≤4	None	Ps	Talkative to friends 1	No contribution to class discussions 1	Instructions that demand written response 'seemingly' not attended to 1
3	≤4	Ps	Ps	May 'tune out' 1	Does not always participate in class discussions 1	
4	5 to10	Ps; Pd	Ps; Pd	Appears often to lose focus 1		Often requires repeat of instructions 1
5	≥11	Ps; Pd; Tc	Ps; Pd	Easily distracted 1; Great verbal skills only when focused 1		
6	≥11	Pd	Pd		Inconsistent participation in class discussions 1	Can appear not to listen (disengaged) 1
7	≥11	Pd	None			Have own direction in which they want to go 1
8	≥11	Pd	Pd		Dominates conversations 1; Calls out answers 1	
9	≥11	Pd	Tc			Appears not to listen (fiddling)but can still respond and ask questions 1; Instructions requiring written response 'seemingly not attended to 1
10	5 to 10	Pd	Pd	Easily distracted 1	Interrupts when someone is sharing an interest 1	Poor listening 1
11	≥11					Attending to instructions well can be influenced by how experience has affected self-esteem 1
Total responses				8	7	8

Note. Abbreviations: G study = training in gifted education; L/Dif study = training in Learning difficulties; Ps = Pre-service training; Pd = Professional development; Tc = Tertiary course; N= none; numeral 1 next to each item indicates a separate trait noted by the respondent in each category

Appendix 10. Teacher Perceptions Questionnaire: Emotional indicators (themes)

ID	Years of teaching	G study	L/Dif study	Visual signs observable in approach to school work	Interactions
1	≤4	Ps; Pd	Ps; Pd		High self-esteem fuelled by peer attention and sport ability 1; Inappropriate social behaviours for a laugh 1; Highly excitable and always on lookout for attention 1
2	≤4	None	Ps		
3	≤4	Ps	Ps	Visual signs of emotion when disappointed or unhappy with achievements 1	Independent 1; Very effervescent but quiet in discussions 1
4	5 to 10	Ps; Pd	Ps; Pd	Cries often 1; Frustrated easily 1; Expresses anger by physical contact 1	
5	≥11	Ps; Pd; Tc	Ps; Pd	Low self-esteem 1	Somewhat needy in social situations 1
6	≥11	Pd	Pd	Sensitive 1	Sensitive to criticism 1; Some social issues with peers/ behaviour 1
7	≥11	Pd	None		Sensitivities to the responses of peers 1
8	≥11	Pd	Pd	Frustrated 1; Anxious 1; Boredom? 1	
9	≥11	Pd	Tc	Frustration, leading to outbursts of oppositional stubborn behaviour 1; Disengaged from 'hands on' or visually presented work, e.g., work sheets 1 Self-esteem continued to drop from K-6 – saw self as a poor learner /achiever 1	
10	5 to 10	Pd	Pd	Obsessive behaviour 1; Impressionable – easily led 1; Agitation from possible overload on 'Working memory'? 1 (cc from O.C.)	Acute awareness of being excluded 1; Needs a good role model 1
11	≥11	Pd	Pd	Confused self-esteem unless teachers/parents are very supportive, patient and teach discipline 1; Frustration and distractibility 1; Withdrawn in area of difficulty 1	
Total responses				18	11

Note. Abbreviations: G study = training in gifted education; L/Dif study = training in Learning difficulties; Ps = Pre-service training; Pd = Professional development; Tc = Tertiary course; N= none; cc = cross code; cc from O.C. = relevant trait taken from table Other characteristics; numeral 1 next to each item indicates a separate trait noted by the respondent in each category

Appendix 11. Teacher Perceptions Questionnaire: Other characteristics

ID	Years of teaching	G study	L/Dif study	Other traits	Variations	General points
1	≤4	Ps; Pd	Ps; Pd			Family background information about the child 1; Possible formal assessment 1
2	≤4	None	Ps	Very quiet 1		
3	≤4	Ps	Ps	Prefers to work independently 1		
5	≥11	Ps; Pd; Tc	Ps; Pd	Quirky 1; Asynchronous 1; Does not quite fit the mould 1; Some area of social deficiency..1 (cc to LD)		
6	≥11	Pd	Pd	Not a risk taker 1 (cc to W.A.); Disorganised 1 (cc to LD)		
9	≥11	Pd	Tc		Each possible GLD child's characteristics can vary 1	
10	5 to 10	Pd	Pd	Agitation from possible overload on 'Working memory'? 1(cc to E.I)		
11	≥11	Pd	Pd		Sometimes slow starters but if they build on strengths and consistently work diligently to overcome weaknesses can become very successful 1	
Total responses				9	2	2

Note. Abbreviations: G study = training in gifted education; L/Dif study = training in Learning difficulties; Ps = Pre-service training; Pd = Professional development; Tc = Tertiary course; N= none; E. I. = Emotional indicators category; W.A. = Work application category; cc = cross code; numeral 1 next to each item indicates a separate trait noted by the respondent in each category; Teachers ID: 4, ID: 7 and ID: 8 did not add comments in this section.

Appendix 12. Teacher Perceptions Questionnaire: Predominant themes in each category

Categories	Total responses	Predominant theme	Second theme	Third theme	Fourth theme	Fifth	Sixth	Seventh	Eighth	Ninth	Tenth
Strengths	54	Thinking skills 13	Oral language 11	Subject or specific area 8	Creativity 6	Knowledge and interests 6	Numeracy 4	Leadership 2	Memory 2	Listening 1	Visual learner 1
Learning difficulties	41	Handwriting coordination 10	Subject or specific area 10	Writing 6	Level of focus 3	Organisation 4	Gross motor 2	Memory 2	Interactions 2	Creativity 1	Time issues 1
Work Application	28	Attention difficulties 8	Incomplete tasks 7	Confidence/ frustration issues 6	Work quality issues 3	Prefers socialising rather than work 2	Prefers relating to adults 1	Decision making 1			
Achievement on standardised tests	23	Inconsistencies 14	Strength in at least one area 5	Less than average result 4							
Talking and listening skills	23	Distractible 8	Possible irregular listening or attention patterns 8	Issues pertaining to class discussions 7							
Emotional indicators	29	Visible signs in approach to school work 18	Interactions 11								
Other possible characteristics	13	Other traits 9	Variations 2	General information 2							

Note: Numerals indicate the number of responses out of the Total responses that reflect each particular theme

Appendix 13. Power point presentation for the Staff meeting

Notes accompanying power-point presentation to the Staff of St Michael's

Slide 1

THE TITLE OF THE RESEARCH PROJECT

OPENING THE DOORS OF POSSIBILITY FOR GIFTED CHILDREN WITH LEARNING DIFFICULTIES: INITIAL IDENTIFICATION STRATEGIES FOR PRIMARY SCHOOL TEACHERS

(Notes)

I have had the privilege of working towards preparing to conduct some research through UNE into an area that I am passionate about and that is opening up possibilities for children who have significant potential but who have the challenges of one or more learning difficulties. These children are often referred to as GLD. However we are going beyond the label.

Slide 2

AIM OF THE PROJECT

To begin the process of developing and implementing a list of characteristics /indicators (checklist) to assist in identifying children who may have significant/very high achievement potential and also learning difficulties (GLD). These difficulties can manifest in all areas of literacy and numeracy as well as in executive functioning (e.g; organising oneself, planning, and retrieving information from memory).

This list would include the key characteristics/indicators of this very diverse group of GLD children and would focus on:-

i) significant /high achievement potential,

ii) possible academic difficulties

iii) socio- emotional vulnerabilities

iv) behavioural traits

(An initial identification checklist would be an important tool for teachers to start the process leading to possible diagnosis and/or appropriate intervention.)

(Notes)

The aim is to develop a list, a checklist for primary school teachers to use as an initial step in identifying children who may have significant learning potential but have learning difficulties. There are lists available, but there is a need for further development or refinement to make sure that the characteristics are preferably research-based and clear for teachers to understand.

Even when the goal of developing a checklist is achieved it would still need to go through the process of testing in a wider population to ensure that it is valid.

Slide 3

SOME KEY CHARACTERISTICS

Significant /very high achievement potential:

- Great reasoning ability
- Often high verbal ability
- Advanced knowledge in at least one area of interest
- Tends to be able to 'get it' without learning the sequential steps
- Quick to comprehend but may have reading difficulties

Slide 4

LEARNING DIFFICULTIES

Some categories:-

SLD (Specific Learning difficulties); *ASD*; *ADHD; EMOTIONAL/BEHAVIORAL*

Learning difficulties can manifest in all areas of education, e.g;

- Literacy and/or numeracy

(Significant percentage of GLD children have problems with written expression and hand writing coordination)

- High anxiety levels
- Socio/emotional issues
- Difficulties in organisation and planning
- Maintaining attention to routine tasks
- Short term and or long term memory difficulties e.g. recalling instructions
- Discrepancy between verbal skills and performance

Slide 5

MAIN BENEFITS FOR THE SCHOOL AND THE CHILDREN

- Review and appraise the children's standardised test results in mainly Years 3 to 6
- Enhance awareness of the characteristics and needs of GLD children through teacher professional development
- Develop skill and confidence in using an initial identification checklist
- Provide a basis for consideration of further curriculum modification/differentiation

Slide 6 Typical GLD profiles

ARE THERE TYPICAL GLD PROFILES?

- GLD where the learning difficulties are very difficult to detect (These children often do very well in primary school until more demand is placed on their area of undetected 'difficulty' e.g; comprehension)
- An observable learning difficulty and also gifted potential
- GLD that are unidentified as having LD or giftedness (classic case of masking) and can appear as average

Slide 7 What does the research entail?

WHAT ARE THE STEPS INVOLVED IN THE RESEARCH?

1) **PART ONE**
- Voluntary Teacher Perceptions Questionnaire (TPQ) of GLD characteristics (10 minutes)

2) **PART TWO**
- Presentation to Staff –explaining the project and also seeking teachers' opinions about whether there are other children who may have a 'spark' but whose standardised test results may not feature at either end of the spectrum (20 minutes)

3) **PART THREE**
- Learning support staff and researcher develop the Teacher Checklist Questionnaire (TCQ) (approximately 3 to 6 sessions of 40 minutes)

3) **PART FOUR**
- Trial the Checklist, ranking child subjects on all the items (Learning support staff & class teachers – 15 minutes per child)

(Notes)

- Teacher questionnaire (spare copies available)
- The teacher focus-group and I will work on developing a checklist
- Organise three lists of children (List 1 and 2 will be based on the standardised test results)
- Trial the Checklist – comparing the characteristics of each child with the checklist (invite class teacher of these children to try the checklist and would offer to take class for the period required,
- Case study (would only expect very few children)
- Review findings of project and determine recommendations

Slide 8

CASE STUDY INVOLVING ANY POSSIBLE GLD CHILDREN

5) **PART FIVE** – Individual case study

- Parent/class teacher questionnaire about child's strengths and perceived 'challenges'
- Review other relevant results in child's file
- Interview with child about interests and perceptions about their learning (10-15 minutes)

More formal assessment procedures, where necessary, could include any one or two of the following:

- Raven's Standard Progressive Matrices
- Think aloud assessment

(formal assessments would require one or two sessions of 40 minutes)

6) **PART SIX**

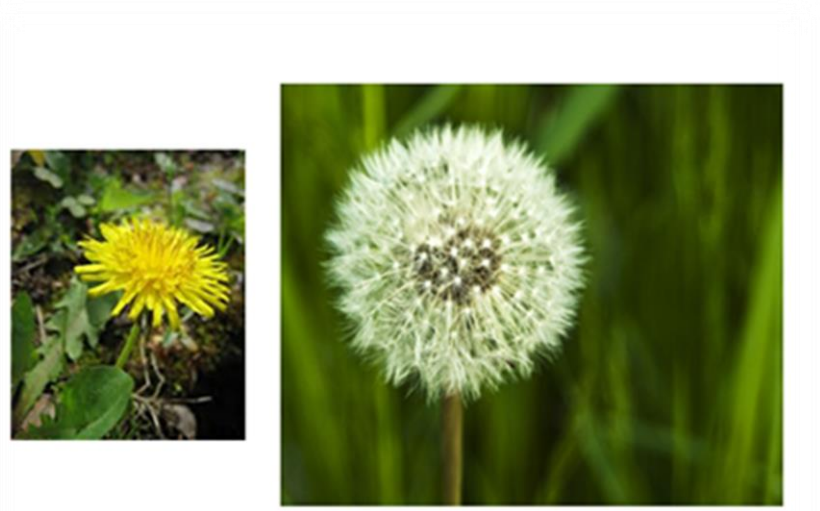
- Review of the findings of the Study in terms of the Checklist and the Case studies to determine key recommendations.

Slide 9

KEY POINTS FROM THE STAFF MEETING PARTICIPANTS' INFORMATION PAGE

- You will be invited to take part in a collective informal interview during the Staff meeting (August 7th) to determine if any of the children in your class (mainly from Years 3 to 6), could be underachieving but not featuring in either 'end' of the spectrum of standardised test results.
- With your permission this interview would be audio recorded so that I can accurately recall and transcribe the information that you provide. If you would like to see a copy of the transcript then this would be available.
- Your insights may be quoted but they will remain confidential. No individual will be identified by name in any publication of the results. Any names used will be replaced by pseudonyms to ensure that no participants are identifiable.

Slide 10



The Study will be trialling the Checklist with three lists/groups of children (Groups 1 and 2 have been mentioned) The third group would consist of any children who may be in the low-to-average band of results (and don’t feature at either end of the spectrum of standardised test results) and yet show a spark or perhaps a keen knowledge in a key area. Do you have a child in your class who may qualify for Group 3?

Appendix 14. Sample of agenda for teacher focus-group meeting

Developing a list of characteristics for the identification of GLD (2e) children

DATE… Wednesday afternoon August 7th (before the staff meeting)

PREPARATION: USB of summary of GLD (2e) characteristics, voice recorder, access to promethean board (if possible, otherwise information will be on A3 sheets), highlighters, pencils and A4 paper for any notes.

Confirm signing of consent form after opportunity to ask questions.

Make reference to the use of a voice recorder.

Show pertinent slides of a power point presentation giving an outline of the phases of the research project. Outline the proposed time schedule!

Establish the need for the development of a GLD (2e) checklist for primary school teachers.

Review a summary of the research based characteristics of children with gifted/high ability (who also have a learning difficulty).

Discuss the items used in the 'gifted potential' section in terms of their clarity and suitability for a checklist for use by primary school teachers. Consider whether these need to be placed under categories. (Make reference to the fact that other characteristics may be highlighted by Staff in their questionnaire responses. The data from these will be analysed and presented for review at the next session.)

Determine a suitable time for Session 2.

Advise Principal/Assistant Principal of this time (A copy of the transcript will be given to them once it has been 'member checked').

Appendix 15. Typical transcript for teacher focus-group session

Transcript of typical teacher focus-group session

The teacher focus-group met at 12 o'clock in an available room.

Session 1 followed the agenda up to and including the point about whether the characteristics should be placed in categories.

It was felt during the session that it may be the preferable option to place the characteristics under Gagné's six domains.

A question arose about where characteristics dealing with emotion (including sensitivity, intensity and 'over excitability') would be placed in terms of the domains.

The teacher focus-group reviewed the literature based characteristics for 'significant learning potential'.

A transcript of the session will be made available for review after 'member checking' during Session 2.

The next session will be held on August 14th, at 11.00am.

Appendix 16. Teacher Checklist Questionnaire literature sources

SECTION A : INDICATORS OF POSSIBLE SIGNIFICANT LEARNING POTENTIAL FROM LITERATURE SOURCES

SECTION A MENTAL CATEGORIES	**Research/evidence based**	**Anecdotal or unspecified primary source** (items taken/adapted from one or more of listed authors)
INTELLECTUAL		
1 Achieves a high score in one or more components of an ability test or in a school standardised test		Bees (2009); Clark (2008); Montgomery (2009, 2015); Potential Plus UK (2014–2017); Renzulli & Reis (1997); Rogers (2012); Silverman (1993); Wills & Munro (2009); Whitmore (1980)
2 Excels at tasks requiring abstract thinking and problem solving	Nielsen (2002); Reis (1989); Renzulli (2005)	
3 Learns new concepts quickly and easily		
4 Has natural flair in science and or 'space and geometry' in mathematics		
5 Shows very high ability/skill in one or more areas	Nielsen (2002)	
6 Asks in-depth and challenging questions	Montgomery (2009)	
7 Reveals an in-depth knowledge of an area of high interest	Nielsen (2002)	
8 Uses an extensive and advanced vocabulary	Nielsen (2002); Reis (1989); Renzulli (2005)	
9 Shows advanced reasoning skills in response to difficult questions		
10 Grasps concepts all at once rather than step by step	Nielsen (2002)	
11 Comprehends very easily	Nielsen (2002)	
12 Shows advanced insights about complex topics	Nielsen (2002)	
13 Excels in puzzles and mazes		
14 Has excellent visual memory		
CREATIVE		
1 Shows a very active and distinctive imagination	Nielsen (2002)	Bees (2009); Clark (2008); Gagné (2010,2011); Neihart & Betts (2010); Potential Plus UK (2014–2017); Silverman (1993); Wills & Munro (2009)
2 Shows a very high level of creativity	Nielsen (2002)	
3 Is highly inventive and original	Nielsen (2002)	
4 Reveals a very keen sense of humour-often quirky	Nielsen (2002)	
5 Shows very high ability in one or more of the creative arts		

SECTION A MENTAL CATEGORIES	Research/evidence based	Anecdotal or unspecified primary source (items taken/adapted from one or more of listed authors)
SOCIAL		
1 Is recognised for leadership skills		Gagné (2011); Clark (2008)
2 Reveals a very persuasive and convincing manner		Gagné (2011)
3 Has a heightened awareness of the needs of others		
PERCEPTUAL		
1 Is extremely sensitive to sound variations		Clark (2008); Gagné (2011); Montgomery (2009)
2 Reveals a keen awareness of fine visual detail		
3 Shows an advanced visual spatial awareness, e.g., flair in 'judging' and performing physical movements		
4 Experiences a marked sensitivity to certain tastes and or food textures		
5 Has an acute sense of smell		
6 Reveals an in-depth level of perception, e.g., seems to be able to tap into a deeper level of wisdom or inspiration		

SECTION A PHYSICAL CATEGORIES	Research/evidence based	Anecdotal or unspecified primary source (items taken/adapted from one or more of listed authors)
MUSCULAR (large physical)		
1 Has exceptional physical endurance, e.g., rarely tires		Gagné (2010)
2 Excels in gross motor activities, e.g., athletics, basketball,		
MOTOR CONTROL		
1 Has great skills and quick reflexes in computer games		Gagné (2010, 2011)
2 Draws with precision		
3 Has excellent manual dexterity,		

SECTION B: INDICATORS OF POSSIBLE LEARNING DIFFICULTIES

SECTION B LEARNING DIFFICULTY CATEGORIES	Research/evidence based	Anecdotal or unspecified primary source
ACADEMIC DIFFICULTIES		
1 Experiences difficulty in articulating thoughts or at times 'getting to the point'	Nielsen (2002)	
2 Finds abstract verbal information difficult to remember and comprehend	Nielsen (2002)	Rogers (2012) **
3 Shows a discrepancy between listening comprehension and reading comprehension	Munro (2005)	
4 Experiences difficulties with the mechanics of reading, e.g., tracking, word decoding, fluency		Montgomery (2009) *; Munro (2002); Wills & Munro (2009)
5 Experiences challenges with reading comprehension		
6 Shows a significant gap between verbal ability and written skills	Assouline et al. (2010)	
7 Reveals a discrepancy between written work and potential	Assouline et al. (2010)	
8 Has difficulty in writing at the level expected		Bees (2009) - linked to Item 13; Rogers (2012) **
9 Takes considerable time to actually write	Nielsen (2002)	
10 Takes considerable time to respond verbally	Nielsen (2002)	
11 Has spelling difficulties	Montgomery (2009)	Bees (2009); Montgomery (2009); Potential Plus UK (2014–2017); Rogers (2012) **; Wills & Munro (2009)
12 Experiences difficulty with phonics	Montgomery (2009)	
13 Has handwriting coordination difficulties or problems completing paper and pencil tasks	Montgomery (2000)	
14 Shows uneven academic skills,	Nielsen (2002)	
15 Has difficulty remembering number facts		
16 Experiences difficulty understanding mathematical concepts and problem solving		
17 Can experience difficulty in completing school work, e.g., may not follow a task through to its completion	Montgomery (2009) *; Nielsen (2002)	Bees (2009); Potential Plus UK (2014–2017); Rogers (2012) **
18 Can experience challenges with doing simple tasks, yet proficiency in doing more complex ones		
19 Has difficulty completing tasks with a sequence of steps		
20 Shows diminished work performance under time pressure		
21 Has difficulty remaining focused during more cognitively challenging tasks, but attends well when there is less cognitive demand		Rogers (2012) **; Whitmore (1982); Potential Plus UK (2014–2017)

SECTION B LEARNING DIFFICULTY CATEGORIES	Research/evidence based	Anecdotal or unspecified primary source
22 Experiences challenges with concentration, e.g., difficulty remaining on task	Nielsen (2002) (school records) – fits in with Item 23; Montgomery (2009) *	
23 Reveals challenges with listening skills	Nielsen (2002)	
24 Can be easily distracted	Nielsen (2002); Montgomery (2009)	Bees (2009); Potential Plus UK (2014–2017)
25 Experiences challenges with short term or long term memory	Nielsen (2002)	
26 Experiences difficulty in remembering and following verbal directions	Nielsen (2002)	
SOCIO-EMOTIONAL		
1 Experiences persistent dissatisfaction with achievements	Montgomery (2009) *	
2 Has feelings of academic inadequacy	Neihart (2011) (based on her research although the study is not specified)	Bees (2009); Potential Plus UK (2014–2017); Rogers (2012) **; Wills & Munro (2009); Whitmore (1980)
3 Avoids trying new activities	Montgomery (2009) *	
4 Experiences intense frustration	Nielsen (2002)	
5 Is very sensitive to criticism	Schiff, Kaufman, and Kaufman (1981)	
	Silverman (1989)	
6 Reveals a fluctuating level of self-esteem and confidence	Nielsen (2002); Montgomery (2009) *	
7 Can experience a high level of anxiety	Neihart (2011) (based on her research although the study is not specified)	
8 Worries frequently about losing things, or other concerning issues		
9 Fluctuates emotionally	Neihart (2011) (related and based on her research although the study is not specified)	
10 Experiences challenges with social skills	Nielsen (2002) ; Montgomery (2009) *; Neihart (2011) (related and based on her research although the study is not specified)	Bees (2009); Potential Plus UK (2014–2017); Whitmore (1980)
11 Can be somewhat isolated from peers	Nielsen (2002) (can be linked to Item 10);	
12 Sets unrealistically high or low self–expectations	Silverman 1989 (research based); Montgomery (2009) *	
13 Finds working in groups difficult	Nielsen (2002) linked to 10; Montgomery (2009) *	
14 Can be withdrawn	Nielsen (2002)	
OTHER BEHAVIOURS		
1 At times may show overly physical behaviours	Whitmore (1980)	

SECTION B LEARNING DIFFICULTY CATEGORIES	Research/evidence based	Anecdotal or unspecified primary source
2 Experiences problems with organisation, e.g., managing time and work space	Nielsen (2002)	Bees (2009); Potential Plus UK (2014–2017); Rogers (2012) **
3 Has fine motor/coordination issues, e.g., low muscle tone affecting posture in sitting, drawing and handwriting	Nielsen (2002)	
4 Prone to bumping into things or misjudging where things are	Nielsen (2002)	
5 Fatigues easily with reading		
6 Can appear unmotivated	Nielsen (2002)	Bees (2009); Neihart & Betts (2010); Potential Plus UK (2014–2017); Whitmore (1980)
7 Can show an indifferent attitude about school or lack of engagement with school work	Nielsen (2002); Montgomery (2009) *; Neihart (2011) (related and based on her research although the study is not specified)	
8 Can be impulsive, e.g., interrupting, making physical contact	Nielsen (2002); Montgomery (2009);	
9 Can be hyperactive	Nielsen (2002) linked to Item 8; Montgomery (2009)	
10 Can have behavioural issues at school	Nielsen (2002); Neihart (2011) (related and based on her research although the study is not specified)	
11 Experiences frustrations from being a perfectionist		

SECTION B LEARNING DIFFICULTY CATEGORIES	Research/evidence based	Anecdotal or unspecified primary source
OTHER BEHAVIOURS		
12 Is skilled in making excuses to avoid difficult tasks, e.g., requests for drinks		
13 Can becomes unsettled with a change of routine	Nielsen (2002)	
14 Prone to repetitive behaviours patterns, e.g., fidgeting, rocking		Rogers (2012) **
15 Prefers solitary activities		

Note.* = Montgomery refers to studies of Pringle (1970); Whitmore (1980); Butler-Por (1987); Silverman (1989); and Montgomery (2000); ** = 'Rogers Student Screener Inventory: Set 1' (developed in Year 2 to assist classroom teachers determine twice-exceptionality more systematically);

Appendix 17. Teacher Checklist Questionnaire: Optional open responses

Child Subject ID	St	Yr	F/ M	Teacher responses added to ratings	'Other observations' in Section A	'Other observations' in Section B
ID:1	1	2	F		Enjoys sport but does not excel	Seems content with own company
ID:2	1	2	F	Advanced insight question "depends on what we're doing"	Loves art, not sure whether she plays an instrument; Very responsible/reliable; Social issues; Anxiety at times; Excellent swimmer	Social interaction is improving; Likes perfection; Task avoidance -excuses are evident when not coping emotionally
ID:3	1	2	M	Strong in Maths, but not in reading or spelling	Very quiet, caring and confident with peers	
ID:4	1	2	F		Loves challenges particularly in Mathematics; Very confident in own abilities	Possible high anxiety; Repetitive rocking
ID:5	1	2	M		Loves reading; excited by Mathematics; Creative in interest areas; Very coordinated and physically capable especially in sports; Very tall	Sets very high self-expectations; Needs reassurance with new tasks or if uncertain about the accuracy of his work
ID: 6	2	3	M			A leader in class; Shy satisfaction with success
ID:9a *	2	3	M	Diminished work performance being observed once or twice	Empathetic; Not noted as a leader; Quite good at sports; Early childhood ear difficulties	Prefers his own group
ID:9b *	2	3	M	AGAT Stanine: 7; TORCH: 4	History of chronic ear infections; Severe chronic illness	
ID:10	2	4	F	High ability in writing and drama; Average in Mathematics; Rating for understanding of mathematical concepts depends on concept area		
ID:11	2	4	M	Flair in science; High ability in music; Progress in behaviour	Very protective of sibling	Prefers computer word processing rather than writing by hand; limited effort in writing; more in-depth writing is expected
ID:12	2	4	M	High ability in drama and visual arts; Strong in hand-eye skills in games e.g., Australian Rules Football		Strives to complete work and has a good positive working habit
ID:13	2	4	M			English as Second

Child Subject ID	St	Yr	F/ M	Teacher responses added to ratings	'Other observations' in Section A	'Other observations' in Section B
						Language
ID:16	3	5	F	Possibly has frustrations	Uncertain about gross muscular skills – possibly plays basketball and netball outside of school; Very considerate	Does not always participate in discussions; Worries, internalises things
ID:17	3	5	M	High ability in sport; Comprehends sometimes - more commonly in Mathematics	Leadership qualities but often too strong; Extremely physical; Quite talented	Untidy handwriting; Rushes even when ample time given; Lively but appears to have settled
ID:18	3	5	M	Next to the rating of 'Sometimes' for difficulty in work completion is written: "Lazy?"	A great speller; Skill in running	Worries about Mathematics but always does well in tests; Often thinking about other things and misses instructions; A real dreamer! A slow mover and can't hurry
ID:19	3	5	M	Natural flair often in Mathematics; High interest in video games		Concentration may be affected by family bereavement; Behavioural issues at times; Unsure if task avoidance may be attributable to it being difficult or not being engaged
ID:20	3	6	F			Always checks time and seems a little anxious about completing tasks in time; Sometimes has difficulty with reading comprehension and will question the 'logic' of the answers
ID:21	3	6	M		Very strong in literacy (written and spoken); Loves to read especially about 'war'; Great reasoning when engaged; Bi-lingual; 'ESL'; Not as physically strong as peers	More self-awareness rather than peers, but strong awareness of adults and younger children; In-depth level of perception when engaged; Appears not to be listening sometimes, but is aware of classroom conversations
ID:22	3	6	M		Science is a strong area of interest because it engages him; IT knowledge is strong but not necessarily ability; Respected for care of younger students	Sensory integration? Uncoordinated, lacks gross motor skills as compared to peers
ID:23	3	6	F		Can 'dumb down' when communicating, but always applies herself; Loves to read and explore concepts	

Child Subject ID	St	Yr	F/ M	Teacher responses added to ratings	'Other observations' in Section A	'Other observations' in Section B
					particularly on human rights; Extremely strong awareness of others' needs; Musical, plays instrument and also netball	
ID:24	3	6	F		Brain is always 'ticking over'; Likes to question and explore concepts more deeply; Loves complex novels; Always thinking of others and seeks to be actively involved in outreach; Very logical yet creative; Not strong physically	Does not always make eye contact

Note. Abbreviations: St = Stage; Yr = (Class level); F/M = F (female) and M (male); ID: 10* and ID: 11* = evaluation of job-share Teacher 1 (blue highlight) and 2 (yellow) of one of the child subjects; No comments for ID: 7, ID: 8a & ID: 8b, ID: 14, and ID 15

Appendix 18. Standardised test results of child subjects (Years 1 to 3)

Child	Year level	Chronological age	Year	Burt		Waddington reading		Waddington spelling		TORCH
				Raw score	Reading age	Raw score	Reading age	Raw score	Spelling age	Stanine based on Year 3 scores
ID:1 Yr2 F	1	6.9	2012	42	7.08–8.02	38	8.02–8.06	38	8.5	
	1	7.03	2012	55	8.10–9.04	49	9.09	59	9.06	
ID:2 Yr 2 F	1	7.00	2012	44	7.10–8.04	42	8.10	25	7.10	
	1	7.06	2012	61	9.08–10.02	50	9.11	53	9.02	
ID:3 Yr 2 M	1	7.01	2012	31	6.09–7.03	34	7.10–8.02	20	7.8	
	1	7.07	2012	40	7.06–8.00	38	8.03	30	8.01	
ID:4 Yr 2 F	1	6.09	2012	46	8.00–8.06	40	8.05–8.09	61	9.10	
	1	7.03	2012	78	11.11–12.05	49	9.09	69	10.07	
ID:5 Yr 2 M	1	7.00	2012	81	Beyond 12.03–12.09	51	10.06	59	9.08	
	1	7.06	2012	80	12.03–12.09	49	9.09	65	10.00	
ID:6 Yr 3 M	1	6.9	2011	47	8.01–8.07	41	8.8	59	9.8	
	1	7.3	2011	88	>12.09	54	10.7	70	11.0	
	2	7.4	2012	90	12.03–12.09	58	11.4	67	10.4	
	2	7.10	2012	-	-	53	10.6	69	10.7	6
ID:7 Yr 3 F	1	7.3	2011	58	9.02–9.08	40	8. 7	60	9.9	
	1	7.9	2011	76	11.07–12.01	47	9.4	64	9.11	
	2	8.2	2012	74	11.03–11.06	46	9.7	68	10.7	
	2	8.8	2012	77	11.09–12.03	52	10.4	68	10.6	8
ID:8 Yr 3 M	1	6.8	2011	42	7.08–8.02	43	9.1	51	9.3	
	2	8.2	2012	-	-			69	10.6	9
ID:9 Yr 3 M	1	7.2	2011	41	7.07–8.01	28	7.5	32	8.2	
	1	7.8	2011	49	8.03–8.09	41	8.6	52	9.2	
	2	8.2	2012	57	9.01–9.07	44	9.3	59	9.8	
	2	8.8	2012	-	-	44	9.0	64	9.11	4

Note. Abbreviations: F = female and M = male; Highlighted ID = Case study participant

Appendix 19. Standardised test results of child subjects (Years 4 to 6)

Child	Year level	Chronological age	Year	Torch			Pat Maths B			SA Spelling Test	
				Raw score	Perc'ile	Reading Age or Stanine	Raw score	Perc'ile	Stanine	Raw score	Spelling age
ID:10 Yr 4 F	2	7.7	2011	89		12.09+				68	10.7
				52		10.7					
	2	8.1	2011	92		12.09+				67	10.3
				55		11.0					
	3	8.8	2012	17	81	7	34	92	8	42	11.2
	3	9.2	2012	19	96	8	34	92	8	52	14.11
ID:11 Yr 4 M	2	7.10	2011	94		>12.03–12.09				69/70	10.10
				56		11.2					
	2	8.4	2011	97		>12.03–12.09				67/70	10.3
				56		11.0					
	3	8.11	2012	15	65	6	32	82	7	42	11.2
	3	9.5	2012	17	84	7	35	95	9	58	16+
ID:12 Yr 4 M	2	7.6	2011	87		>12.03–12.09				47	9.10
				47		9.10					
	2	8.0	2011	85		>12.03–12.09				69	10.7
				51		10.2					
	3	8.6	2012	19	97	9	29	62	6	48	13.0
	3	8.11	2012	18	90	8	35	95	9	59	16.0+
ID:13 Yr 4 M	2	7.4	2011	51		8.05–8.11				46	8.11
				40		8.7					
	2	7.10	2011	56		8.11–9.05				51	9.1
				45		9.1					
	3	8.5	2012	16	73	6	32	82	7	38	10.2
	3	8.10	2012	12	55	5	33	87	8	37	9.5
ID:14 Yr 4 M	2	–	2011	–	–	–	–	–	–	–	–
	2	–	2011	–	–	–	–	–	–	–	–

Child	Year level	Chronological age	Year	Torch			Pat Maths B			SA Spelling Test	
				Raw score	Perc'ile	Reading Age or Stanine	Raw score	Perc'ile	Stanine	Raw score	Spelling age
Started at school in 2012	3	8.4	2012	16	73	6	30	68	5	37	9.11
	3	8.10	2012	14	67	6	34	92	8	37	9.11
ID:15 Yr 4 M	2	7.8	2011	61		9.08–10.03				60/70	9.9
	2	8.2	2011	78		11.11–12.05				64/70	9.11
	3	8.8	2012	17	81	7	37	99	9	36	9.6
	3	9.1	2012	18	90	8	36	98	9	40	10.0
ID:16 Yr 5 F	3	7.11	2011	17	84	7	33	87	8	49	13.5
	3	8.5	2011	19	96	8	31	75	7	61	16.0+
	4	9.3	2012	19	84	7	34	81	7	54	16.0+
	4	9.9	2012	17	86	7	33	73	7	64	16.0+
ID:17 Yr 5 M	3	7.11	2011	12	55	5	-	-		38	10.2
	3	8.5	2011	17	84	7	31	75	7	39	10.5
	4	9.3	2012	17	71	6	32	63	6	39	10.5
	4	9.9	2012	12	54	5	33	73	7	35	9.4
ID:18 Yr 5 M	3	8.7	2011	18	96	8	34	92	8	46	12.5
	3	9.1	2011	20	99	9	34	92	8	56	16.0+
	4	9.11	2012	20	90	8	37	98	9	53	15.7
	4	10.5	2012	17	86	7	36	95	9	61	16.0+
ID:19 Yr 5 M	3	8.5	2011	13	60	6	24	37	4	47	12.8
	3	8.11	2011	17	84	7	31	75	7	56	16.0+
	4	9.9	2012	17	71	6	33	72	7	51	14.4
	4	10.3	2012	12	54	5	34	81	7	59	16+
ID:20 Yr 6 F	4	9.9	2011	21	96	8	34	81	7	42	11.2
	4	10.3	2011	10	42	5	33	73	7	48	11.7
	5	10.8	2012	15	66	6	32	82	7	47	12.8
	5	11.2	2012	20	77	6	35	90	8	52	14.11
ID:21 Yr 6 M	5	10.5	2012	14	59	5	30	77	7	43	11.5

Child	Year level	Chronological age	Year	Torch			Pat Maths B			SA Spelling Test	
				Raw score	Perc'ile	Reading Age or Stanine	Raw score	Perc'ile	Stanine	Raw score	Spelling age
Started at the school in 2012	5	10.11	2012	16	52	5	31	63	6	59	16+
ID:22 Yr 6 M	4	9.5	2011	16	65	6	33	72	7	36	9.6
	4	9.11	2011	18	92	8	36	95	9	30	8.2
	5	10.5	2012	15	66	6	31	77	7	34	9.1
	5	10.11	2012	21	84	7	26	37	5	39	10.5
ID:23 Yr 6 F	4	9.10	2011	22	99	9	37	98	9	48	13.0
	4	10.4	2011	18	92	8	36	95	9	58	16.0
	5	10.10	2012	20	99	9	33	87	7	52	14.11
	5	11.3	2012	23	98	8	35	90	8	62	16+
ID:24 Yr 6 F	4	9.9	2011	19	84	7	34	81	7	45	12.2
	4	10.3	2011	17	86	7	36	95	9	53	13.2
	5	10.8	2012	14	59	5	34	90	8	45	12.2
	5	11.2	2012	24	99	9	33	78	7	56	16+

Note. Highlighted ID = Case study participants; Aqua highlight indicates Year 1 and Year 2 May assessments; Perc'ile = Percentile

Appendix 20. Teacher Checklist Questionnaire child subjects' scores for each category

Child ID and pseudonym	Age in years	F (Female) M (Male)	Year level	Stage	Trialling group	Intellectual	Creative	Social	Perceptual	Muscular	Motor control	Academic difficulties	Socio emotional	Other behaviours
ID:1 Alana	8 y 1 m	F	2	1	1	67	24	16	17	5	8	52	37	30
ID:2 Lily	8 y 4 m	F	2	1	2	60	22	12	21	8	10	52	53	38
ID:3 Alex	8 y 5 m	M	2	1	3	52	12	11	13	8	8	63	28	32
ID:4 Jess	8 y 1 m	F	2	1	2	84	28	14	26	8	15	52	34	36
ID:5 Luke	8 y 4 m	M	2	1	2	78	23	15	26	10	16	52	61	48
ID:6 Lachlan	8 y 8 m	M	3	2	1	52	17	15	16	9	11	47	14	18
ID:7 Harriet	9 y 6 m	F	3	2	3	48	13	15	14	8	11	48	14	15
ID:8a Nathan	9 y 0 m	M	3	2	1	74	20	14	16	4	11	29	14	15
ID:8b Nathan	9 y 0 m	M	3	2	1	84	30	17	23	10	15	52	28	32
ID:9a Dominic	9 y 5 m	M	3	2	3	57	20	8	12	6	14	68	32	30
ID:9b Dominic	9 y 5 m	M	3	2	3	69	23	10	20	4	15	120	39	50
ID:10 Nicole	10 y 0 m	F	4	2	1	68	27	15	15	4	9	33	14	15
ID:11 Jeremy	10 y 1 m	M	4	2	2	75	22	13	14	5	15	40	30	24
ID:12 Ben	9 y 9 m	M	4	2	1	62	20	15	16	12	12	28	14	15
ID:13 Hugh	9 y 7 m	M	4	2	2	65	20	15	23	10	15	55	17	21
ID:14 David	9 y 2 m	M	4	2	1	72	23	13	23	10	14	38	17	30
ID:15 James	10 y 0 m	M	4	2	2	71	22	12	23	10	13	44	34	24
ID:16 Erin	10 y 8 m	F	5	3	2	60	19	16	21	5	10	54	34	33
ID:17 Richard	10 y 8 m	M	5	3	3	40	12	13	17	12	8	78	32	46
ID:18 Scott	10 y 2 m	M	5	3	2	60	10	8	17	6	8	69	38	34
ID:19 Ian	11 y 2 m	M	5	3	3	64	18	8	17	4	9	72	32	40

Child ID and pseudonym	Age in years	F (Female) M (Male)	Year level	Stage	Trialling group	Intellectual	Creative	Social	Perceptual	Muscular	Motor control	Academic difficulties	Socio emotional	Other behaviours
ID:20 Miriam	12 y 1 m	F	6	3	2	67	25	14	19	5	9	59	34	32
ID:21 Michael	11 y 9 m	M	6	3	3	71	19	12	15	4	12	93	49	50
ID:22 Christopher	11y 9 m	M	6	3	3	54	23	11	22	4	11	127	65	63
ID:23 Anne	12 y 3m	F	6	3	1	69	25	18	20	5	12	51	28	32
ID:24 Skye	12 y 1 m	F	6	3	2	73	27	16	16	4	6	56	52	32
Mean						65.23	20.92	13.31	18.54	6.92	11.42	58.92	32.46	32.12
Std. Deviation	8 y 1 m					10.633	5.083	2.739	3.972	2.741	2.831	24.013	14.564	12.320

Note. Highlighted ID = Case study participant; 9a = ranking by job-share Teacher 1 and 9b = ranking by job-share Teacher 2

Appendix 21. Teacher Checklist Questionnaire sample of class teacher's observations

SUMMARY OF CLASS TEACHERS' OBSERVATIONS IN THE TRIALLING OF THE CHECKLIST Child: Year Level: Date of assessment: September 2013		
Categories Non-highlighted areas could be Not observed or Uncertain	Rank	Areas that may benefit from on-going support
Strengths		
achieves high scores in standardised tests	Always	No academic needs noted
abstract thinking	Often	
ease of learning new concepts	Often	
natural flair in science, space and geometry	Often	
shows very high ability in at least one area	Often	
asks in-depth questions	Often	
in-depth knowledge of an area of high interest	Often	
extensive and advanced vocabulary	Often	
advanced reasoning skills in response to difficult questions	Often	
able to grasp concepts all at once	Often	
comprehends very easily	Often	
advanced insights about complex topics	S/t	
excels in puzzles and mazes		
excellent visual memory	S/t	
Creative		
imagination	Often	
high level of creativity	S/t	
inventive and original	Often	
very keen sense of humour	Often	
very high ability in one or more of the creative arts	Often	
Social		
leadership	Often	
has a heightened awareness of the needs of others	Always	
persuasive and convincing	Often	
Perceptual		
shows an in-depth level of perception	Often	
keen awareness of fine visual detail	S/t	
visual spatial awareness		
Muscular		
physical endurance		
excels in gross motor activities		
Motor control		
skills and quick reflexes in computer games		
draws with precision		
manual dexterity		
Other information (including AGAT results if available):		
Comments for parent: (Example only) The Checklist consists of characteristics that have been found by researchers to be found in children's varying abilities and learning needs. ID: 4's teacher completed the Checklist and the results in this questionnaire show her very high intellectual and creative ability. She also has an in-depth level of perception and shows skills in drawing with precision and also in manual dexterity. She can at times show anxiety but this often goes with the territory of being a perfectionist.		

Note. Highlighted traits indicate Always or Often; S/t = Sometimes

Appendix 22. TCQ categories – Inter- item statistics

Item-Total Statistics – Intellectual category (except job-share Teacher Two)

Intellectual	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
A Intellectual: Achieves a high score	59.333	95.275	.598	.885	.914
A Intellectual: Excels in abstract thinking	59.792	92.781	.732	.900	.910
A Intellectual: Learns new concepts easily	59.208	98.172	.517	.960	.916
A Intellectual: Natural flair in science and or space and geometry in Mathematics	59.750	93.500	.489	.809	.918
A Intellectual: Very high ability in one or more areas	59.167	99.275	.332	.939	.921
A Intellectual: In-depth and challenging questions	60.042	82.911	.860	.945	.903
A Intellectual: In-depth knowledge of an area of high interest	59.833	85.362	.755	.813	.908
A Intellectual: Advanced vocabulary	59.875	86.723	.790	.974	.906
A Intellectual: Advanced reasoning skills	59.667	91.188	.714	.931	.909
A Intellectual: Grasps concepts all at once rather than step by step	59.708	92.129	.693	.889	.910
A Intellectual: Comprehends very easily e.g., deductions	59.583	94.341	.764	.831	.910
A Intellectual: Advanced insights	60.000	86.261	.855	.956	.904
A Intellectual: Excels in puzzles and mazes	60.208	93.737	.499	.686	.917
A Intellectual: Excellent visual memory	59.625	96.505	.409	.608	.920

Item-Total Statistics - Creative category (except job-share Teacher Two)

Creative	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
A Creative: Very active and distinctive imagination	16.00	15.565	.735	.667	.845
A Creative: Very high level of creativity	16.54	17.303	.720	.709	.854
A Creative: Highly inventive and original	16.46	15.129	.824	.702	.824
A Creative: Very keen sense of humour	16.29	15.433	.676	.594	.861
A Creative: Very high creative ability in at least one of the creative arts	16.54	15.998	.628	.659	.873

Item-Total Statistics Social category (except job-share Teacher Two)

Social	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
A Social: Recognised for leadership skills	8.88	2.897	.746	.562	.595
A Social: Has a very persuasive and convincing manner	9.33	3.188	.616	.411	.755
A Social: Heightened awareness of others' needs	8.38	4.332	.598	.408	.780

Item-Total Statistics Perceptual category (except job-share Teacher Two)

Perceptual	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
A Perceptual: Extremely sensitive to sound variations	15.79	12.346	.722	.557	.574
A Perceptual: Keen awareness of fine visual detail	15.00	10.435	.454	.482	.612
A Perceptual: Advanced visual spatial awareness	15.00	10.870	.358	.301	.657
A Perceptual: Marked sensitivity to the smell and texture of certain foods	15.71	12.911	.386	.953	.637
A Perceptual: Acute sense of smell	15.75	13.152	.343	.953	.648
A Perceptual: In-depth level of perception	14.21	11.911	.349	.260	.649

Item-Total Statistics Muscular category (except job-share Teacher Two, but too few items for review)

Muscular	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
A Muscular: Exceptional physical endurance	3.54	1.998	.815	.664	.
A Muscular: Excels in gross motor activities	3.37	2.071	.815	.664	.

Item-Total Statistics Motor control category (except job-share Teacher Two)

Motor control	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
A Motor control: Great skills in computer games	7.63	3.723	.375	.445	.592
A Motor control: Draws with precision	7.46	4.955	.229	.263	.755
A Motor control: Excellent manual dexterity	7.17	3.275	.732	.543	.053

Item-Total Statistics Academic difficulties category (except job-share Teacher Two)

Academic difficulties	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
B Academic difficulties: Difficulty articulating thoughts	53.79	419.911	.619	.	.962
B Academic difficulties: Difficulty in remembering and comprehending abstract verbal information	54.33	433.710	.455	.	.963
B Academic difficulties: Discrepancy between listening and reading comprehension	54.75	422.370	.846	.	.960
B Academic difficulties: Difficulty in the mechanics of reading	54.46	439.563	.521	.	.962
B Academic difficulties: Difficulty in reading comprehension	54.42	441.732	.414	.	.963
B Academic difficulties: Gap between verbal ability and written skills	54.38	429.810	.523	.	.963
B Academic difficulties: Discrepancy between written work and potential	53.88	414.375	.693	.	.961
B Academic difficulties: Difficulty writing at level expected	54.50	417.478	.754	.	.961
B Academic difficulties: Takes considerable time to actually write	54.25	426.543	.532	.	.963
B Academic difficulties: Takes considerable time to respond verbally	54.38	426.418	.593	.	.962
B Academic difficulties: Spelling difficulties	54.67	418.319	.777	.	.960
B Academic difficulties: Phonics difficulties	54.88	426.810	.862	.	.960
B Academic difficulties: Handwriting co-ordination difficulties or completing paper and pencil tasks	54.63	416.332	.759	.	.961
B Academic difficulties: Uneven academic skills	54.33	434.232	.479	.	.963
B Academic difficulties: Difficulty remembering number facts	54.63	431.114	.711	.	.961
B Academic difficulties: Difficulty understanding mathematical concepts and problem solving	54.46	435.389	.466	.	.963
B Academic difficulties: Difficulty completing school work	54.67	416.145	.853	.	.960
B Academic difficulties: Difficulty in simple tasks but proficiency in more complex one	54.71	415.172	.860	.	.960

Academic difficulties	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
B Academic difficulties: Difficulty in completing tasks with a sequence of steps	54.88	426.462	.873	.	.960
B Academic difficulties: Diminished work quality with time pressure	54.67	416.493	.816	.	.960
B Academic difficulties: Focusses well when tasks are less cognitively demanding but not with cognitive demand	54.75	423.674	.854	.	.960
B Academic difficulties: Concentration challenges	54.42	401.732	.897	.	.959
B Academic difficulties: Challenges in listening skills	54.67	414.580	.888	.	.959
B Academic difficulties: Easily distracted	54.00	418.435	.640	.	.962
B Academic difficulties: Challenges with short or long-term memory	54.88	425.245	.855	.	.960
B Academic difficulties: Difficulty in remembering and following verbal directions	54.33	414.493	.792	.	.960

Item-Total Statistics Socio-emotional difficulties category (except job- share Teacher Two)

Socio-emotional difficulties	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
B Socio-emotional: Dissatisfaction with achievement	30.21	200.259	.719	.886	.953
B Socio-emotional: Feels academic inadequacy	30.17	200.580	.647	.783	.955
B Socio-emotional: Avoids trying new activities	30.46	201.650	.832	.920	.951
B Socio-emotional: Intense frustration	30.21	200.433	.787	.911	.952
B Socio-emotional: Sensitive to criticism	29.63	187.549	.847	.959	.950
B Socio-emotional: Fluctuating self -esteem	30.04	188.389	.907	.931	.948
B Socio-emotional: High anxiety	29.63	188.766	.817	.975	.951
B Socio-emotional: Frequently worries	30.13	199.766	.632	.886	.955
B Socio-emotional: Fluctuates emotionally	30.04	195.520	.861	.942	.950
B Socio-emotional: Social skills' issues	30.04	203.172	.634	.919	.955
B Socio-emotional: Isolated from peers	30.29	205.955	.654	.928	.954
B Socio-emotional: Unrealistically high or low self - expectations	29.96	194.737	.809	.815	.951
B Socio-emotional: Difficulty in group work	29.96	197.607	.711	.958	.953
B Socio-emotional: Withdrawn	30.13	195.071	.836	.913	.950

Item-Total Statistics Other behaviours difficulties category (except job- share Teacher two)

Other behaviours difficulties	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
B Other behaviours: Overly physical	29.42	133.471	.663	.	.919
B Other behaviours: Problems with organisation	29.17	125.884	.732	.	.917
B Other behaviours: Fine motor issues	29.54	130.172	.803	.	.915
B Other behaviours: Bumps into things	29.58	133.993	.820	.	.917
B Other behaviours: Fatigues easily with reading	29.63	133.810	.815	.	.917
B Other behaviours: Appears unmotivated	28.96	132.129	.550	.	.923
B Other behaviours: Indifferent attitude to school	29.17	129.971	.665	.	.919
B Other behaviours: Impulsive	29.38	134.332	.562	.	.922
B Other behaviours: Hyperactive	29.42	133.471	.663	.	.919
B Other behaviours: Behavioural issues	29.42	129.645	.834	.	.914
B Other behaviours: Perfectionist frustrations	28.71	140.824	.239	.	.933
B Other behaviours: Task avoidance	29.29	126.476	.732	.	.917
B Other behaviours: Unsettled with change of routine	29.50	131.913	.773	.	.916
B Other behaviours: Repetitive behaviours	29.25	129.152	.630	.	.920
B Other behaviours: Prefers solitary activities	28.83	131.971	.538	.	.923

Appendix 23. Teacher Checklist Questionnaire Spearman's Rho (except job-share Teacher 2)

Checklist questionnaire categories			Intellectual domain variables	Creative domain variables	Social domain variables	Perceptual domain variables	Muscular domain variables	Motor control variables	Academic difficulties variables	Socio-emotional variables	Other behaviours
Spearman's rho	Intellectual domain variables	Correlation Coefficient	1.000	.661**	.232	.319	-.209	.447*	-.380	.153	-.023
		Sig. (2-tailed)	.	.000	.276	.128	.326	.028	.067	.476	.915
		N	24	24	24	24	24	24	24	24	24
	Creative domain variables	Correlation Coefficient	.661**	1.000	.405*	.380	-.255	.214	-.289	.232	-.013
		Sig. (2-tailed)	.000	.	.050	.067	.229	.316	.172	.276	.950
		N	24	24	24	24	24	24	24	24	24
	Social domain variables	Correlation Coefficient	.232	.405*	1.000	.133	.025	.012	-.464*	-.230	-.365
		Sig. (2-tailed)	.276	.050	.	.535	.907	.957	.022	.280	.080
		N	24	24	24	24	24	24	24	24	24
	Perceptual domain variables	Correlation Coefficient	.319	.380	.133	1.000	.310	.318	.011	.399	.380
		Sig. (2-tailed)	.128	.067	.535	.	.141	.130	.959	.053	.067
		N	24	24	24	24	24	24	24	24	24
	Muscular domain variables	Correlation Coefficient	-.209	-.255	.025	.310	1.000	.345	-.238	-.216	-.153
		Sig. (2-tailed)	.326	.229	.907	.141	.	.099	.263	.310	.475
		N	24	24	24	24	24	24	24	24	24
	Motor control variables	Correlation Coefficient	.447*	.214	.012	.318	.345	1.000	-.341	-.129	-.125

Checklist questionnaire categories			Intellectual domain variables	Creative domain variables	Social domain variables	Perceptual domain variables	Muscular domain variables	Motor control variables	Academic difficulties variables	Socio-emotional variables	Other behaviours
		Sig. (2-tailed)	.028	.316	.957	.130	.099	.	.103	.549	.561
		N	24	24	24	24	24	24	24	24	24
	Academic difficulties variables	Correlation Coefficient	-.380	-.289	-.464*	.011	-.238	-.341	1.000	.605**	.768**
		Sig. (2-tailed)	.067	.172	.022	.959	.263	.103	.	.002	.000
		N	24	24	24	24	24	24	24	24	24
	Socio-emotional variables	Correlation Coefficient	.153	.232	-.230	.399	-.216	-.129	.605**	1.000	.806**
		Sig. (2-tailed)	.476	.276	.280	.053	.310	.549	.002	.	.000
		N	24	24	24	24	24	24	24	24	24
	Other behaviours	Correlation Coefficient	-.023	-.013	-.365	.380	-.153	-.125	.768**	.806**	1.000
		Sig. (2-tailed)	.915	.950	.080	.067	.475	.561	.000	.000	.
		N	24	24	24	24	24	24	24	24	24

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

Appendix 24. Teacher Checklist Questionnaire Kruskal-Wallis *H* Test results (except job-share Teacher 2)

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Intellectual domain variables is the same across categories of 1=high standardised tests, 2=ditto possible LD, 3=hidden ability.	Independent-Samples Kruskal-Wallis Test	.028	Reject the null hypothesis.
2	The distribution of Creative domain variables is the same across categories of 1=high standardised tests, 2=ditto possible LD, 3=hidden ability.	Independent-Samples Kruskal-Wallis Test	.056	Retain the null hypothesis.
3	The distribution of Social domain variables is the same across categories of 1=high standardised tests, 2=ditto possible LD, 3=hidden ability.	Independent-Samples Kruskal-Wallis Test	.017	Reject the null hypothesis.
4	The distribution of Perceptual domain variables is the same across categories of 1=high standardised tests, 2=ditto possible LD, 3=hidden ability.	Independent-Samples Kruskal-Wallis Test	.049	Reject the null hypothesis.
5	The distribution of Muscular domain varables is the same across categories of 1=high standardised tests, 2=ditto possible LD, 3=hidden ability.	Independent-Samples Kruskal-Wallis Test	.769	Retain the null hypothesis.
6	The distribution of Motor control variables is the same across categories of 1=high standardised tests, 2=ditto possible LD, 3=hidden ability.	Independent-Samples Kruskal-Wallis Test	.650	Retain the null hypothesis.
7	The distribution of Academic difficulties variables is the same across categories of 1=high standardised tests, 2=ditto possible LD, 3=hidden ability.	Independent-Samples Kruskal-Wallis Test	.001	Reject the null hypothesis.
8	The distribution of Socio-emotional variables is the same across categories of 1=high standardised tests, 2=ditto possible LD, 3=hidden ability.	Independent-Samples Kruskal-Wallis Test	.016	Reject the null hypothesis.
9	The distribution of Other behaviours is the same across categories of 1=high standardised tests, 2=ditto possible LD, 3=hidden ability.	Independent-Samples Kruskal-Wallis Test	.024	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Appendix 25. Teacher Checklist Questionnaire Mann-Whitney *U* Test comparing results between genders (except job-share Teacher 2)

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Intellectual domain variables is the same across categories of Male or female.	Independent-Samples Mann-Whitney U Test	.682[1]	Retain the null hypothesis.
2	The distribution of Creative domain variables is the same across categories of Male or female.	Independent-Samples Mann-Whitney U Test	.010[1]	Reject the null hypothesis.
3	The distribution of Social domain variables is the same across categories of Male or female.	Independent-Samples Mann-Whitney U Test	.005[1]	Reject the null hypothesis.
4	The distribution of Perceptual domain variables is the same across categories of Male or female.	Independent-Samples Mann-Whitney U Test	.682[1]	Retain the null hypothesis.
5	The distribution of Muscular domain varables is the same across categories of Male or female.	Independent-Samples Mann-Whitney U Test	.174[1]	Retain the null hypothesis.
6	The distribution of Motor control variables is the same across categories of Male or female.	Independent-Samples Mann-Whitney U Test	.155[1]	Retain the null hypothesis.
7	The distribution of Academic difficulties variables is the same across categories of Male or female.	Independent-Samples Mann-Whitney U Test	.519[1]	Retain the null hypothesis.
8	The distribution of Socio-emotional variables is the same across categories of Male or female.	Independent-Samples Mann-Whitney U Test	.599[1]	Retain the null hypothesis.
9	The distribution of Other behaviours is the same across categories of Male or female.	Independent-Samples Mann-Whitney U Test	.815[1]	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

[1] Exact significance is displayed for this test.

Appendix 26. Teacher Checklist Questionnaire Mann-Whitney *U* Test mean ranks (except job-share Teacher 2)

	Male or female	N	Mean Rank	Sum of Ranks
Intellectual domain variables	boy	15	12.00	180.00
	girl	9	13.33	120.00
	Total	24		
Creative domain variables	boy	15	9.70	145.50
	girl	9	17.17	154.50
	Total	24		
Social domain variables	boy	15	9.47	142.00
	girl	9	17.56	158.00
	Total	24		
Perceptual domain variables	boy	15	12.03	180.50
	girl	9	13.28	119.50
	Total	24		
Muscular domain variables	boy	15	14.03	210.50
	girl	9	9.94	89.50
	Total	24		
Motor control variables	boy	15	14.13	212.00
	girl	9	9.78	88.00
	Total	24		
Academic difficulties variables	boy	15	13.23	198.50
	girl	9	11.28	101.50
	Total	24		
Socio-emotional variables	boy	15	11.87	178.00
	girl	9	13.56	122.00
	Total	24		
Other behaviours	boy	15	12.77	191.50
	girl	9	12.06	108.50
	Total	24		

Test Statistics[a] (Mann- Whitney *U* for Checklist)

	Intellectual domain variables	Creative domain variables	Social domain variables	Perceptual domain variables	Muscular domain variables	Motor control variables	Academic difficulties variables	Socio-emotional variables	Other behaviours
Mann-Whitney U	60.000	25.500	22.000	60.500	44.500	43.000	56.500	58.000	63.500
Wilcoxon W	180.000	145.500	142.000	180.500	89.500	88.000	101.500	178.000	108.500
Z	-.448	-2.516	-2.747	-.420	-1.395	-1.472	-.657	-.571	-.240
Asymp. Sig. (2-tailed)	.654	.012	.006	.675	.163	.141	.511	.568	.810
Exact Sig. [2*(1-tailed Sig.)]	.682[b]	.010[b]	.005[b]	.682[b]	.174[b]	.155[b]	.519[b]	.599[b]	.815[b]

a. Grouping Variable: Male or female; b. Not corrected for ties.

Appendix 27. Teacher Checklist Questionnaire (untrialled) proposed master summary page

Suggested instructions for recording the results from the Checklist

Section A: Indicators of significant learning potential

1. Select at least three different coloured highlighters. Highlight items scored with Always' (6) 'Often' (5) and 'Uncertain' (3). You may also wish to highlight any other descriptor that may be of interest or importance to you, e.g., 'Not observed' (2). (See below for an example of the suggested recording process.)

2. In the space provided, total the number of 'Often' and 'Always' together and then the number of items ranked 'Uncertain'. Note items that you may be uncertain about, which may warrant further investigation.

3. In the Comments section make a note of any points that you wish to record, e.g., your proposed 'follow up' which might be a discussion with the Learning Support staff regarding possible further assessment (in consultation with parents); or thoughts about curriculum differentiation, etc.

Section B: Indicators of possible learning difficulties

1. The same procedure for Section A 1, but you may prefer to also highlight 'sometimes' which may warrant further investigation.

2. The same procedure for Section A 2.

3. For the Comments section you may consider checking through the child's records for any evidence of possible learning difficulties. It would be recommended that this process occurs in consultation with the school's Learning Support staff.

Scores:

Below Section A and Section B for each category, record the number of times a ranking score appears under Not Applicable (N.A.), Not observed (N.O.), Uncertain (U), Sometimes (S/t), Often (O), Always (A).

RESULTS OF CHECKLIST ASSESSMENT

Teacher: Child: Year level: Date……..

SECTION A: INDICATORS OF POSSIBLE SIGNIFICANT LEARNING POTENTIAL

MENTAL CATEGORIES					PHYSICAL CATEGORIES	
INTELLECTUAL		**CREATIVE**	**SOCIAL**	**PERCEPTUAL**	**MUSCULAR**	**MOTOR CONTROL**
1. High score in one or more components of an ability test or in a school standardised test	9. Advanced reasoning skills in responses to difficult questions	1. Very active and distinctive imagination	1. Leadership skills	1. Is extremely sensitive to sound variations	1. Exceptional physical endurance	1. Great skills and quick reflexes in computer games
2. Excels at abstract thinking and problem solving	10. Grasps concepts all at once	2. Very high level of creativity	2. Persuasive and convincing manner	2. Keen awareness of fine visual detail	2. Excels in gross motor activities	2. Draws with precision
3. Learns new concepts quickly and easily	11. Comprehends very easily	3. Is highly inventive and original	3. Awareness of needs of others	3. Advanced visual spatial awareness		3. Excellent manual dexterity
4. Has natural flair in science and/or 'space and geometry' in maths	12. Advanced insights about complex topics	4. Reveals a very keen sense of humour		4.Sensitivity to certain tastes and or food textures		
5. Shows very high ability/skill in one or more areas	13. Excels in puzzles and mazes	5. High ability in one or more of the creative arts		5. Has an acute sense of smell		
6. In-depth and challenging questions	14. Excellent visual memory			6. In-depth level of perception		
7. In-depth knowledge of an area of high interest						
8. Extensive and advanced vocab						

COMMENTS											
INTELLECTUAL		**CREATIVE**		**SOCIAL**		**PERCEPTUAL**		**MUSCULAR**		**MOTOR CONTROL**	
N.A. /14 N.O. /14 U. /14	S/t /14 O /14 A /14	N. /14 A. /14 N.O. /14 U.	S/t /14 O /14 A /14	N.A. /14 N.O. /14 U. /14	S/t /14 O /14 A /14	N.A. /14 N.O. /14 U. /14	S/t /14 O /14 A /14	N.A. /14 N.O. /14 U. /14	S/t /14 O /14 A /14	N.A. /14 N.O. /14 U. /14	S/t /14 O /14 A /14

SECTION B: INDICATORS OF POSSIBLE LEARNING DIFFICULTIES

ACADEMIC DIFFICULTIES	SOCIO-EMOTIONAL	OTHER BEHAVIOURS
1.Exeriences difficulty articulating thoughts/ getting to the point	1. Persistent dissatisfaction with achievement	1. At times may show overly physical behaviours
2. Abstract verbal information difficult to remember and comprehend	2. Has feelings of academic inadequacy	2. Experiences problems with organisation
3. Discrepancy between listening and reading comprehension	3. Avoids trying new activities	3. Has fine motor/coordination issues
4. Experiences difficulties with the mechanics of reading	4. Experiences intense frustration	4. Prone to bumping into things or misjudging where things are
5. Experiences challenges with reading comprehension	5. Is very sensitive to criticism	5. Fatigues easily with reading
6. Shows a significant gap between verbal ability and written skills	6. Fluctuating level of self-esteem and confidence	6. Can appear unmotivated
7. Reveals a discrepancy between written work and potential	7. Can experience a high level of anxiety	7. Indifferent attitude about school and/or school work
8. Has difficulty in writing at the level expected	8. Worries frequently e.g., about losing things	8. Can be impulsive
9. Takes considerable time to actually write	9. Fluctuates emotionally	9. Can be hyperactive
10. Takes considerable time to respond verbally	10. Experiences challenges with social skills	10. Can have behavioural issues at school
11. Has spelling difficulties	11. Can be somewhat isolated from peers	11. Experiences frustrations from being a perfectionist
12. Experiences difficulty with phonics	12. Unrealistically high or low self–expectations	12. Is skilled in making excuses to avoid difficult tasks
13. Handwriting co-ordination difficulties or problems completing paper and pencil tasks	13. Finds working in groups difficult	13. Can become unsettled with change of routine
14. Shows uneven academic skills	14. Can be withdrawn	14. Prone to repetitive behaviours patterns
15. Has difficulty remembering number facts		15. Prefers solitary activities
16. Difficulty understanding mathematical concepts and problem solving		
17. Can experience difficulty in completing school work		

ACADEMIC DIFFICULTIES		SOCIO-EMOTIONAL		OTHER BEHAVIOURS	
18. Can experience challenges with doing simple tasks, yet proficiency in doing more complex ones					
19. Has difficulty completing tasks with a sequence of steps					
20. Shows diminished work performance under time pressure					
21. Difficulty remaining focused in more cognitively challenging tasks but attends well when there is less cognitive demand					
22. Experiences challenges with concentration					
23. Reveals challenges with listening skills					
24. Can be easily distracted					
25. Experiences challenges with short term or long term memory					
26. Experiences difficulty in remembering and following verbal directions					
N.A. /14 N. O. /14 U. /14	S/t /14 O /14 A /14	N.A. /14 N. O. /14 U. /14	S/t /14 O /14 A /14	N.A. /14 N. O. /14 U. /14	S/t /14 O /14 A /14

Appendix 28. Formal interview with each Case-study participant

Participants: Each child selected for the Case study

Purpose: To determine the child's interests, perceptions about academic achievements and any areas where they would like to become more confident. (The researcher has been teaching at the proposed school site for a number of years, which will be an advantage when interviewing the children.)

Duration: 15 minutes

Agenda:

After explaining that the research project is designed to find out about children's abilities and how we can further support their learning, the following questions will be posed:

What are the things that you really like about school?

What special hobbies do you have?

What are the things that really excite you?

If you were given a choice, what topics would you love to study at school or at home?

Are you satisfied with how you are going in your school work? What are your best achievements? (These may include academic, creative, public speaking, drama and sporting endeavours.)

Are there any areas in your school work where you would like to become more skilled?

Is it easy for you to concentrate on your work, or do you sometimes think of other things or even like to explore what's in your pencil case or in your pocket?

Can you remember things easily, including when your teacher gives you instructions?

How much do you enjoy reading? How confident do you feel in sounding out new words and understanding what the text means? Are there any challenges you experience in reading?

Appendix 29. Text samples for the Think-aloud procedure

Stilton, G. (2013, pp. 106-108) ***The Volcano of fire: The fifth adventure in the kingdom of fantasy***.New York, NY: Scholastic

Narrative text read by Dominic (ID: 1)

The volcano rose up from the ground, fierce and imposing. Immediately, my fur stood on end.

Oh, how did I get myself into these situations? I was scared out of my wits!

Then, as I looked closer, I realised something even more frightening. Plumes of smoke were spewing out of the top of the volcano!

"That's strange", said Sterling. "The Volcano of Fire has been dormant for centuries. Smoke should not be coming out of its crater".

"That's not strange, that's deadly!" I shrieked, completely forgetting I was trying to act brave. "Run for your life!"

I tried to run, but Sterling grabbed me by the tail.

"It's okay, Knight", Sterling said soothingly. "It's okay to be scared. But we need to finish our mission. We need to find Sproutness and figure out what's setting off the earthquakes".

I chewed my pawnails. "I-I-I'm n-n-not scared", I stammered.

"I just thought that it might be a good idea to go for a run before we climb the volcano. You know, warm up the muscles a little bit."

Thunderhorn put a hand on my shoulder. "Don't be embarrassed Knight", he said. "Everyone gets scared, even the most courageous heroes".

O'Brien, J. (July 2013, pp. 7-10). When the lords of the earth departed (In School Magazine *Touchdown* (Issue no 6) Ryde, NSW: Department of Education and Communities.

Narrative text read by Richard (ID: 2)

Unexpectedly, a bright ball of energy swept through the air towards the elf boy.

It burst into flame, knocking Elreth to the ground. He lay on the damp earth, clutching his stomach and moaning softly.

"Confound it!" cried High Lord Harding. "We'll have to send somebody else".

He turned to view his cowering troops. "You!" he pointed at a trembling Lyndell. "You're almost as small as the elf. You can be the next to go".

Lyndell's insides twisted into tight fearful knots. He realised he was no match for a dark sorcerer. But he did not have the strength to protest.

High Lord Harding glared down at him. "This is a most important mission, young warrior. I want you to…." He broke off in mid-sentence. He turned away from Lyndell.

He held a hand up to an ear. He began pacing up and down, his brow lined with irritation as he listened to something nobody else could hear.

Soon he shook his head. "No! I can't leave the campaign just now. We're on the brink of a great victory".

"Look Mum are you deaf?" "I'm not hungry! And I'm not logging out until we've slaughtered the enemy and finished this level".

Murray, S. (April 2013, p. 17) **Dogs at war** In School Magazine *Orbit* (Vol. 98). Ryde, NSW: Department of Education and Communities.

Non-fiction text read by Dominic (ID: 1) and Richard (ID: 2)

Horses, mules, donkeys and camels have transported soldiers and equipment during times of war. Carrier pigeons have conveyed vital messages. Kangaroos, turtles, parrots, roosters, owls, monkeys, cats, cockatoos, squirrels, rabbits and other animals have been mascots, pets and mates to our military personnel in many theatres of war. But perhaps the most versatile animal to serve in the military is the dog.

Dogs are intelligent, loyal animals. Their devotion and physical traits, such as keen hearing and an excellent sense of smell, make them very useful indeed. Dogs have worked for the Australian military forces for almost a century as guards, sentries, messengers, scouts, trackers, search and rescue team members and explosives detection dogs.

In World War I, German Shepherds guarded equipment, while other dogs served as messengers. In World War II, a little white Egyptian terrier named Horrie could hear aircraft approaching before soldiers could. Horrie could recognise enemy aircraft and he would bark in a special way to give the soldiers time to take cover. Half a world away in Darwin in 1942, a kelpie named Gunner warned of approaching bombers 20 minutes before the enemy planes arrived.

Dogs served with combat tracker teams searching for enemies in the conflicts in Korea and Vietnam. Today, specially trained explosives detection dogs, known as EDDs, are serving in Afghanistan and elsewhere. The dogs sniff out a wide range of explosives, from hidden caches of weapons to bombs buried beside roads. You can read a book based on the brave actions of these dogs. It's called Caesar the war dog by Stephen Dando-Collins.

O'Brien, J. (July 2013, pp 7-10) When the lords of the earth departed In School Magazine *Touchdown,* Issue no 6). Ryde NSW: Department of Education and Communities.

Narrative text read by Christopher (ID: 4)

Lyndell, a boy warrior, crouched behind a fallen tree. He watched as High Lord Harding pointed at a trembling young elf who was cowering nearby. "You! Head along the stream and distract the dark sorcerer who holds up our advance".

The elf-boy, Elreth, considered this for a few seconds. He turned to Lyndell, his eyes filled with fear. But he couldn't refuse an order from a High Lord – such a thing would be impossible. Reluctantly, he nodded. "Yes, Lord Harding".

"Distract that dark sorcerer for just a few minutes and we will turn the course of battle," said the High lord. "Victory will be ours!"
"And what a victory", added the High Queen of the Witches. "A thousand filthy goblins will die if we break through!"
"Their disgusting troll and sorcerer allies will be slaughtered," added the Lord of the Elves. "The Central Kingdoms will be ours!"
He nodded at Elreth. "Off you go, boy".

"Be careful", Lyndell called softly. He watched fearfully as his young elfish friend clambered out of the depression in the ground in which he had been sheltering and started along the stream.

In the distance, a mighty dragon breathed fire at a battalion of young witch-girls on broomsticks. White wizards and dark sorcerers sent lightning hurtling across the skies. Black goblin arrows hissed by overhead.

But Lyndell saw none of this. He was fully focussed on his young friend, who was creeping along the bank of the stream. Elreth had notched an arrow in his bow, but everyone knew it would prove little defence against a dark sorcerer.

Webb, J. (2001, p. 24) Sailing to Atlantis: The Sinbad Chronicles Pymble, Sydney: Angus & Robertson An imprint of HarperCollinsPublishers Pty Limited.

Narrative text read by Michael (ID: 3), Skye (ID: 5), Miriam (ID: 6)

Cyn tried to look small. The rukh circled above them, so huge that every feather was the size of a palm frond.

The downdraught of its wings whipped up little hurricanes of salt spray that stung Cyn's eyes and made it even more difficult for her to see what was happening in the air above.

Then, suddenly, the giant bird climbed high into the sky, turned and darted straight down at Cyn.

It swooped upon her, spearing her windsurfer with its gigantic cruel talons and effortlessly lifting both Cyn and her craft out of the water. The ocean fell away below her and Cyn clung desperately to her windsurfer.

The smell of the rukh was horrible, a combination of rotting meat and damp feathers. Cyn held her breath trying not to be sick.

In the distance she heard the voice of Sinbad, booming out instructions.

"Tie yourself to the mast. The bird will take you to its nest. Stay very still. Use the sail as a shield and stay under its cover. I will come for you".

The great bird flew higher and higher riding the thermals until it began circling what looked like the crater of a volcano.

Think aloud text 'The cycle of growth and destruction'

Catchpole, H. (December 2003-January 2004, pp. 9-16) Bushfires: Preventing a natural disaster. *The Helix*, No. 93. ACT Australia: CSIRO Education.

Non-fiction text (page 11) read by Michael (ID: 3), Christopher (ID: 4), Skye (ID: 5) and Miriam (ID:6)

Australia's weather is routinely affected by various weather patterns – some repeat daily, while others repeat over a much longer time frame. One of the most influential is known as the El Niño Southern Oscillation Index. This climatic condition is caused by a change in sea temperature and height in the Pacific Ocean. An El Niño event means drought for most of south-eastern Australia. Previous El Niño events have occurred during 2002–3, 1997–8 and 1982–3.

When there are periods of severe drought caused by El Niño, the wet forests and alpine areas dry out. These areas become the launching pad for many bushfires because they contain a large amount of dry leaf litter and debris.

But fire is a natural and periodic event in the Australian bush, which can encourage the growth of native plants. After a fire, the number of plant species actually increases. Shrubs such as banksias and wattle, whose seeds may have remained unopened in the soil for years, respond to the heat and crack open, allowing new plants to grow in the rich burnt soil left after the fire.

Learning about how fire affects different vegetation types is important in understanding how to live with bushfires. Bushfires occur in most vegetation types found in Australia, from eucalyptus forest to grassland, shrub lands and even semi-desert conditions. To fight fires, we need to understand when bushfires are likely to burn, and to be able to predict how fast a bushfire will spread once it is burning. Being able to predict how a fire will burn – its speed, intensity, flame height – allows firefighters to be in the right place at the right time.

Appendix 30. Modelling the Think-aloud procedure

Today I would like you to have a go at reading these parts of a text and then to actually talk about any thoughts that might come into your mind. Each part of the text is separated by a blank space and this is a good spot to talk about what might be in your mind or you can talk whenever you want to… You might be wondering what I mean by this so have a look at these kinds of thoughts.

What am I noticing?

What am I figuring out about the characters or the story (or factual text)?

What am I predicting might happen next?

What questions might I ask myself about words that I am unsure of, or about the characters?

How can I figure out the meaning, particularly if it is a little unclear?

Is there a picture that comes into my mind?

My opinions…

Some people say that thinking like this helps us to make sense of what we read and also enjoy it.

To give you an idea of what to do let's look at this sentence.

"**Oh Columbine," her mother moaned, "What shall I do? I'll have to call the plumber".**

What comes into my mind?

I am thinking that Columbine must be fairly smart for her mother to ask her advice about the plumbing. I can tell her mother is not happy because it says that she moaned but I wonder what has gone wrong and will it be something hilarious.

I will read these sentences but will stop to think aloud. Have a look at the text while I am reading.

They were there waiting on the veranda, his mother in the nightgown, his father in the hat, his horse saddled ready to come after him.

I am wondering what is happening here. The fact that the mother is in her nightgown and the father and the horse are ready makes me think something serious might have happened. This might be happening in the country because it talks about a veranda. Hmm, nightgown, that sounds like an old fashioned name so this might have happened in the olden days.

"I've set him free", Bertie cried. "I've set him free so he won't ever have to live behind bars". He was sent to his room at once, where he threw himself on his bed and buried his face in his pillow.

It sounds as though Bertie is the son because he has been ordered to his room. I am unsure about what animal he has set free. I already notice that the situation is very tense because of what is happening – even his mother in her nightie - and the fact that Bertie cried out and repeated..."I've set him free". I question why the author hasn't used an exclamation mark here. I feel that sending Bertie to his room was tough because he obviously is upset and you would think that they would have been more caring.

Day after day his father went out looking for the white lion, but each evening he came back empty handed and blazing with fury.

Aha I get it, the upset is over the missing white lion. What has Bertie got to do with the lion? It says in the previous sentence that he set him free so maybe he has been looking after him. I am wondering about the words 'blazing with fury'. Because Bertie was sent to his room I would say that these words would mean that his father was furious. I like the word blazing. It is great description and really makes me imagine how cross his father must have been. He must have been burning with anger! Wow! I can actually visualise this and also how upset Bertie looks. You know, already, in a kind of way this is reminding me about texts and films that talk about protecting animals. I get a sense that this story will be about this very thing.

Now it is your turn to have a go at thinking aloud about what you are reading. These thoughts can be whatever comes into your mind. If you are unsure don't worry because I will help by asking some questions. May the force be with you!

Extra strategies:

What do you think that this is about?

What clues helped you to think this way?

Any guesses?

Can you tell me anything else?

Appendix 31. Adaptive Think-aloud Framework Section A: Observations of reading skills and related information

ATAF Section A: Adaptive Think-aloud assessment for the Case-study participants: Observations of reading skills and related information		
Child participant: ID: 9 Dominic Age: 9 years Date: December 2013		
Textual passage details – Narrative: Stilton, G. (2013, pp. 106–108) *The volcano of fire* **Non- fiction**: Murray, S.(2013) *Dogs at War* Abbreviations: s/c = self-corrected; N&NF = narrative and non-fiction		
Observations of reading skills		
1. Phonological/semantic/syntactic skills	Observations	Confidence
Decoding	**Narrative** Sounded out: "dormant" as *doughmant* **Non-fiction** Sounded out "conveyed", "mascots", "versatile", "military", "devotion", "Vietnam", "Afghanistan" and "kelpie"	Varies
Word identification	**Narrative** Hesitated over "plumes" Read "stammered" as *stamping,* "soothingly" as *smoothly* (s/c) **Non- fiction** (NF) Read "courageous" as *couragest* (s/c), "we" as *what* (s/c), "caches" as *catches, "*Caeser" *as Kayser*	Varies to mostly
Fluency - reads at an appropriate speed	At times repeats words (N&NF)	Mostly
Appropriate intonation	Emphasis on 'figure' when reading figure out	Mostly
Observes punctuation	(N&NF)	Mostly
Tracking		
Follows direction of text	Appears to follow direction of text in both samples	
Use of tracking aids – finger/aid		
Skips phonemic blends, words or sentences	At times skips blends e.g., left out 'th' in *something* and only read the 'r' sound in *realised*. No issues in the NF text.	
Word meanings		
The misreading, but mostly self-correcting of a number of words would affect meaning. Understanding of most word meanings appeared to be secure. In the NF text there were several misreadings that were not self-corrected.		
2. Previous assessment of any difficulties that may affect reading skills		
Long term chronic illness and early childhood ear difficulties		
Other observations		
In class has been observed to skip lines and even words		
4. Summary of observations of reading skills		
Phonological/semantic/syntactic skills	Overall achievement	
Decoding, Word identification, Fluency, Intonation, Observes punctuation	All range from *varies* to *mostly*	
Tracking	At times skips blends	
Word meanings	Misread six words and s/c three	
5. Other information		
Health difficulties, possible tracking issues		

ATAF Section A: Adaptive Think-aloud assessment for the Case-study participants: Observations of reading skills and related information		
Child participant ID: 17 Richard Age: 10 years Date: December 2013		
Textual passage details – Narrative: O'Brien, J. (2013) When the lords of the earth departed **Non-fiction**: Murray, S.(2013) *Dogs at War;* Abbreviations: s/c = self-corrected; N&NF = narrative and non-fiction		
Observations of reading skills		
1. Phonological/semantic/syntactic skills	Observations	Confidence
Decoding	**Narrative** Sounded out 'Harding' and 'Lyndell' Hesitated over 'irritation' but sounded it quickly. **Non-fiction** *Sounded out 'conveyed'*	Mostly
Word identification	**Narrative** Read "he realised" as *he released;* "shook" as *shuke* (s/c both) Read "brow lined" as a noun then changed brow to *brau* (s/c) Read "listened to something" as *listened to somebody* (s/c) Hesitated over "protest", "we're on the brink", "not logging out", "we've slaughtered" **Non-fiction** *Read "carrier pigeons" as career penguins, "personnel" as personal, and "trackers" as tractors (all s/c)* *Read "Caesar" as Kayser and Stephen as Stephan*	Varies
Fluency - reads at an appropriate speed	(N&NF)	Varies
Appropriate intonation	(N&NF)	Mostly
Observes punctuation	(N&NF)	Mostly
Tracking		
Follows direction of text	Appears to follow direction of text in both samples	
Use of tracking aids – finger/aid		
Skips phonemic blends, words or sentences		
Word meanings		
Misread a number of words and mainly self-corrected		
2. Previous assessment of any difficulties that may affect reading skills		
3. Other observations		
At times when starting to read, places the text at a closer distance than the usual 30cm.		
4. Summary of observations of reading skills		
Phonological/semantic/syntactic skills	Overall achievement	
Decoding, Word identification, Fluency, Intonation, Observes punctuation	All range from *varies* to *usually*	
Tracking	Seems in order	
Word meanings	Misread words which could affect understanding of meaning	
5. Other information		
Closeness of page at times; at times misreads and s/c which may be impacting on comprehension		

ATAF Section A: Adaptive Think-aloud assessment for the Case-study participants: Observations of reading skills and related information		
Child participant ID: 21 Michael Date: December 2013 Age: 11 years		
Textual passage details – Narrative: Webb, J. (2001). *Sailing to Atlantis: The Sinbad Chronicles.* **Non-fiction**: Catchpole, H.(December 2003–January 2004, pp. 9–16) Bushfires: Preventing a natural disaster (page 11); Abbreviations: s/c = self-corrected; N&NF = narrative and non-fiction		
Observations of reading skills		
1. Phonological/semantic/syntactic skills	Observations	Confidence
Decoding	**Narrative** – very confident and expressive Hesitated and partially sounded out the word 'frond' **Non-fiction**	Consistent
Word identification	**Narrative** Read "downdraught" as *downdrort* as well as "and made" as *and it* (s/c) Read "straight down" as *down straight* and "effortlessly" as *effortly* **Non-fiction**	Mostly
Fluency - reads at an appropriate speed	(N&NF)	Consistent
Appropriate intonation	(N&NF)	Consistent
Observes punctuation	(N&NF) Didn't pause at the end of one full stop and lost the flow momentarily.	Mostly
Tracking		
Follows direction of text	Appears to follow direction of text in both samples	
Use of tracking aids – finger/aid	Not observed	
Skips phonemic blends, words or sentences	Commented that at times loses track of place. No issues in either the narrative or factual text	
Word meanings		
Understanding of word meanings appeared to be secure.		
2. Previous assessment of any difficulties that may affect reading skills		
Michael indicated that he had worn glasses for two months and they were making a difference. He is short sighted. For the first month his eyes were watery and on one occasion he wore the glasses to lunch and his eyes became red. A doctor advised that he should occasionally take them off to see how he was managing.		
3. Other observations		
Michael is tired and a little restless, yawns and stretches		
4. Summary of observations of reading skills		
Phonological/semantic/syntactic skills	Overall strong skills	
Decoding, Word identification, Fluency, Intonation, Observes punctuation	In the *confident* range	
Tracking	Appears sound	
Word meanings		
5. Other information		

ATAF Section A: Adaptive Think-aloud assessment for the Case-study participants: Observations of reading skills and related information		
Child participant ID: 22 Christopher Date: December 2013 Age: 11 years		
Textual passage details – Narrative: O'Brien, J. (2013, pp 7–10) When the lords of the earth departed. **Non-fiction**: Catchpole, H. (December 2003–January 2004, pp. 9–16) *Bushfires: Preventing a natural* disaster (page 11); Abbreviations: s/c = self-corrected; N&NF = narrative and non-fiction		
Observations of reading skills		
1. Phonological/semantic/syntactic skills	Observations	Confidence
Decoding	**Narrative** Sounded out "distract", "Lyndell", "Harding", "considered", "disgusting" and "sheltered" **Non-fiction** Sounded out "El Nino" and "banksias" Started off with substituting "But fire is" with *is fire natural* (s/c)	Varies
Word identification	**Narrative** Read "Elreth" as *er-reth* (s/c) Misread "battalion" as *batt- a- lon* Read "bushfires" as *bullfires* (s/c) Misread "climatic" as *climate*, "routinely" as *rootin-ly*, "oscillation" as *oscilliation,* "debris" as *de–breeze* and "periodic" as perreedic **Non-fiction**	Varies
Fluency - reads at an appropriate speed	(N&NF)	Mostly
Appropriate intonation	(N&NF)	Mostly
Observes punctuation	(N&NF) Did not pause at the end of one full stop and lost the flow momentarily.	Mostly
Tracking		
Follows direction of text	Appears to follow direction of text in both samples	
Use of tracking aids – finger/aid	Not observed	
Skips phonemic blends, words or sentences	Commented that at times loses track of place. No issues in either the narrative or factual text	
Word meanings		
Understanding of word meanings appeared to be secure.		
2. Previous assessment of any difficulties that may affect reading skills		
Sensory integration issues		
3. Other observations		
Child participant began rubbing one eye during the reading of the narrative and reported tiredness and sleep deprivation which have been prevalent for some time. Instance of substitution. Sounded out a number of words just to make sure they were correct. Anxious!		
4. Summary of observations of reading skills		
Phonological/semantic/syntactic skills	Overall sound skills	
Decoding, Word identification, Fluency, Intonation, Observes punctuation	In the *varies* to *usually* range	
Tracking	Appears sound	
Word meanings	Misread/misunderstood six words	
5. Other information		

ATAF Section A: Adaptive Think-aloud assessment for the Case-study participants: Observations of reading skills and related information		
Child participant ID: 24 Skye Date: December 2013 Age: 12 years		
Textual passage details – Narrative: O'Brien, J. (2013, pp 7–10) When the lords of the earth departed. **Non-fiction**: Catchpole, H. (December 2003–January 2004, pp. 9–16) *Bushfires: Preventing a natural disaster The Helix* No. 93 CSIRO Education ACT Australia (page 11); Abbreviations: (s/c) = self-corrected, N&NF = narrative and non-fiction		
Observations of reading skills		
1. Phonological/semantic/syntactic skills	Observations	Confidence
Decoding	**Narrative** **Non-fiction**	Consistent
Word identification	**Narrative** Read "downdraught" as *downdrort* **Non-fiction** Read "oscillation" as *ohskilliation*; Hesitated over reading "influential"; "south-eastern" read as southern-eastern (s/c) Read Alpine as alpine; "severe" as sever (s/c); and "debris" read as *de briss*	Mostly
Fluency - reads at an appropriate speed	(N&NF)	Mostly
Appropriate intonation	(N&NF)	Consistent
Observes punctuation	(N&NF)	Consistent
Tracking		
Follows direction of text	Appears to follow direction of text in both samples	
Use of tracking aids – finger/aid	Not observed	
Skips phonemic blends, words or sentences	Not observed	
Word meanings		
Understanding of word meanings appeared to be secure.		
2. Previous assessment of any difficulties that may affect reading skills		
3. Other observations		
Skye really engages with narratives but did not elaborate on strategies to devise meaning. Possible unfamiliarity with the procedure.		
4. Summary of observations of reading skills		
Phonological/semantic/syntactic skills	Overall sound skills	
Decoding, Word identification, Fluency, Intonation, Observes punctuation	In the *usually* range	
Tracking	Appears sound	
Word meanings	Seems secure	
5. Other information		

ATAF Section A: Adaptive Think-aloud assessment for the Case-study participants: Observations of reading skills and related information		
Child participant ID: 20 Miriam Date: December 2013 Age: 12 years		
Textual passage details – Narrative: Webb, J. (2001). *Sailing to Atlantis: The Sinbad Chronicles* **Non-fiction**: Catchpole, H. (December 2003–January 2004, pp. 9–16) *Bushfires: Preventing a natural disaster* (page 11); Abbreviations: s/c = self-corrected; N&NF = narrative and non-fiction		
Observations of reading skills		
1. Phonological/semantic/syntactic skills	Observations	Confidence
Decoding	**Narrative** **Non-fiction** Sounded out "Oscillation" as *esciallation;* "routinely" as *roo- tin- ly*; "debris" as *de - briss*	Mostly
Word identification	**Narrative** Read "palm frond" very precisely just making sure that she had it right. Emphasis on *lons* in "talons". Read:''rukh" as *ruck*; "them" as *him* then s/c Read "downdraught" as *downdrort* and "what was" as *that then* and then *what it was* Read "below" as *beyond,* "occurred" as *often* **Non-fiction** Hesitated over "clung" and read as *clasped* (s/c) Hesitancy in reading "periodic", "banksias", "shrub lands", "semi-desert"	Varies
Fluency - reads at an appropriate speed	(N&NF)	Varies
Appropriate intonation	(N&NF)	Consistent
Observes punctuation	(N&NF)	Consistent
Tracking		
Follows direction of text	Follows very closely, at times substitutes words and skipped a line	
Use of tracking aids – finger/aid	Not observed	
Skips phonemic blends, words or sentences	Not observed	
Word meanings		
Understanding of word meanings appeared to be secure.		
2. Previous assessment of any difficulties that may affect reading skills		
Yes visual processing		
3. Other observations		
One session had to be aborted, because ID 6 was very tired. She had just completed a written assessment and due to visual processing issues may have exhausted herself. There was a follow up which was a marked contrast to the previous occasion. She expends much effort on following meaning of written text.		
4. Summary of observations of reading skills		
Phonological/semantic/syntactic skills	Overall sound skills	
Decoding, Word identification, Fluency, Intonation, Observes punctuation	Varies, hesitancy in sounding out new words	
Tracking	Appears sound	
Word meanings		
5. Other information		

Appendix 32. Adaptive Think-aloud Framework Section B: Assessment of critical thinking and metacognitive skills

Adaptive Think-aloud Framework (ATAF) Section B: Assessment of critical thinking and metacognitive ability (Case-study child participant ID: 9 Dominic) Text: Narrative								
Critical thinking skills/indicators			**Indicators of metacognition**					
Indicators of critical thinking skills	**Types of skills** observed e.g., predicts, clarifies, links, deduces	**Responses from Think Aloud** – text taken from Stilton, G. (2013, pp. 106-108). The volcano of fire: The fifth adventure in the kingdom of fantasy	**Knowledge of cognition**			**Regulation of cognition**	
			D	P	C	R	E
Clarifies							
Infers	1. Deduces meaning of centuries	1. A **century** is a hundred so it is more than a hundred. (c/c Makes Connections)	√			√	
	2. Deduces nervousness	2. Because he is chewing his nails. (c/c Makes Connections)	√				
	3. Predicts	3. There's a volcano that is about to explode. They're going to grab a plane and fly away (c/c Makes Connections)	√			√	
	4. Deduces	4. Cross code from Makes connections no.1	√			√	
	5. Deduces	5. Cross code from Makes connections no.2.	√			√	
Analyses	1. Paraphrases analyses	1. These people are on a **mission to stop the volcano erupting and the earthquake**. One of them is scared and the others are telling him not to be scared.	√			√	
Makes connections	1. Links reference to a mission to then finding cause of earthquake	1. They're trying to figure out what's causing the earthquake. They were **sent on a mission**. (c/c Infers, Makes Connections)	√			√	
	2. Links – text	2. Smoke is coming out of the volcano. They're telling him to run away. They don't want to get hurt. (c/c Infers)	√			√	
	3. Links – text	3. Cross code from Infers no. 1	√			√	
	4. Links – text	4. Cross code from Infers no. 2	√			√	
	5. Links – text	5. Cross code from Infers no. 3	√			√	
Monitors							
Evaluates							

Adaptive Think-aloud Framework (ATAF) Section B: Assessment of critical thinking and metacognitive ability (Case-study child participant ID: 9 Dominic) Text: Narrative							
Questions							
Solves, resolves							
Other possible reflections of metacognitive thinking			**Metalanguage**			M	

Note. Abbreviations: M = modality; **bold text** = metalanguage; green highlight = expressions of metacognitive knowledge and/or regulation of cognition; Links – text = connects to text; c/c = cross coding; ATAF adapted from Bannister-Tyrrell (2013); Klingner (2004); Schellings et al. (2006); Tarricone (2011); and Whitebread et al. (2009)

Adaptive Think-aloud Framework (ATAF) Section B: Assessment of critical thinking and metacognitive ability (Case-study child participant ID: 9 Dominic) Text: Non-fiction								
Critical thinking skills/indicators			**Indicators of metacognition**					
Critical thinking skills	**Types of skills** observed e.g., predicts, clarifies, links, deduces	**Responses from Think Aloud** – text taken from Murray, S. (2013, p.17). Dogs at war	**Knowledge of cognition**			**Regulation of cognition**		
			D	P	C	R	E	
Clarifies								
Infers	1.Deduces that dogs are being looked after	1. Yes, so that they can help use them for the army and also have them live as pets.	√			√		
	2. Deduces	2. They know where **explosives** are - like land mines. (c/c Makes Connections)	√			√		
	3. Deduces dog's ability to detect a plane	3. Maybe he had a very good sense of smell	√			√		
	4. Deduces meaning of *versatile*	4. It is like the **most popular** and best dog **to serve** in the army.	√			√		
Analyses								
Makes connections	1. Links the term *military* to prior experience	1 Like **the 'bases'** of war	√			√		
	2. Links – experience	2. Cross code from Infers no. 2	√			√		
Monitors								
Evaluates								
Questions								
Solves, resolves								
Other possible reflections of metacognitive thinking			**Metalanguage**			M		

Note. Abbreviations: M = modality; **bold text** = metalanguage; green highlight = expressions of metacognitive knowledge and/or regulation of cognition; Links - experience = connects to existing knowledge; c/c = cross coding; ATAF adapted from Bannister-Tyrrell (2013); Klingner (2004); Schellings et al. (2006); Tarricone (2011); and Whitebread et al. (2009)

Adaptive Think-aloud Framework (ATAF) Section B: Assessment of critical thinking and metacognitive ability (Case-study child participant ID: 17 Richard) Text: Narrative								
Critical thinking	**Types of skills** observed e.g., predicts, clarifies, links, deduces	**Responses from Think Aloud** – text taken from O'Brien, J. (2013, p.7) When the lords of earth departed	**Indicators of metacognition**					
			Knowledge of cognition			**Regulation of cognition**		
			D	P	C	R	E	
Clarifies	1. Starts clarification	1. I am unsure what the ball of energy was about?				√		
	2. Questions for clarification	2. Maybe they should have put an exclamation mark there (after 'go')… because it says you can be the next to go (*emphasised "you can be the next to go"* (c/c Makes Connections)	√			√		
		3. Cross code from Making connections (no. 1) (includes modal and pause and metalanguage)	√			√		
Infers	1. Deduces	1. Ah (*laughs*) he is in a game. There is a little boy and a game and a mum is saying for him to come for lunch. (Makes Connections)	√			√		
	2. Deduces	2. Cowering maybe could mean scared troops or nervous – or brave. Because they're fighting.	√			√		
	3. Deduces	3. I think he is dying. His brow is lined … I think it is that bit and it is slowly closing (*pointed to his eye*). (c/c Makes Connections)	√			√		
	4. Deduces	4. I think that they were still having a war against one bad guy. Because it said cowering troops, the dark sorcerer and Lord Harding - a king. Wait, I think he was going back -the Lyndell guy.(c/c Makes Connections)	√			√	√	
	5. Deduces meaning of "insides twisting into knots"	5. The bones I think - tummy or something – I think it is the bones. Insides – they twisted into knots. Maybe not bones – muscles and stuff. Because if it was a bone maybe it would have cracked and it said twisted.(c/c Makes Connections)	√			√	√	
	6. Deduces	6. Cross code from Analyses no.1 (includes modal and pause and metalanguage)	√			√		
	7. Deduces	7. Cross code from Making Connections no.1 (includes modal and pause and metalanguage)	√			√		
	8. Deduces	8. Cross code from Making Connections no.2 (includes modal and metalanguage)	√			√		
	9. Deduces	9. Cross code from Making Connections no.3	√			√		
Analyses	1. Paraphrases analyses	1. Ah maybe Elreth goes on a mission – maybe. Then he got injured so he had to send somebody else. It said the high Lord – probably like the king and because he is injured they save him and they are reluctant to send someone else to go and get something. (c/c Infers, Makes Connections)	√			√		
Makes connections	1. Links to knowledge	1. I'm not too sure about protest. (…) I'm pretty sure that protest means to fight against like in parliament they protest. He did not have the strength to protest – to fight back (c/c Infers, Clarifies)	√			√	√	
	2. Links – text	2. I think that I was right about the wizard with the dark sorceror because it says that he realised	√			√	√	

Adaptive Think-aloud Framework (ATAF) Section B: Assessment of critical thinking and metacognitive ability (Case-study child participant ID: 17 Richard) Text: Narrative							
		that he was no match for the dark sorcerer. I don't think that they were attacking the castle anymore. (c/c Infers)					
	3.Links – text	3. He is hurt because it says clutching his stomach and moaning softly. (c/c Infers)	√				
	4.Links – experience	4. Cross code from Infers no.1 (includes pause)	√			√	
	5. Links – text	5. Cross code from Infers no.3 (includes modal and pause)	√			√	
	6. Links – text	6. Cross code from Infers no.4 (includes modal and pause)	√			√	
	7. Links – experience	7. Cross code from Infers no.5 (includes modal and pause)	√			√	
	8. Analyses	8. Cross code from Analyses no.1 (includes modal and pause and metalanguage)	√			√	
Monitors							
Evaluates							
Questions							
Solves, resolves							
Other possible reflections of metacognitive thinking			**Metalanguage**			M P	

Note. Abbreviations: M = modality; P = pause or non-word responses; **bold text** = metalanguage; green highlight = expressions of metacognitive knowledge and/or regulation of cognition; Links - experience = connects to existing knowledge; Links - text = connects to text; c/c = cross coding; ATAF adapted from Bannister-Tyrrell (2013); Klingner (2004); Schellings et al. (2006); Tarricone (2011); and Whitebread et al. (2009)

Adaptive Think-aloud Framework (ATAF) Section B: Assessment of critical thinking and metacognitive ability (Case-study child participant ID: 17 Richard) Text: Non-fiction								
Critical thinking	**Types of skills** observed e.g., predicts, clarifies, links, deduces	**Responses from Think Aloud** – text taken from Murray, S. (2013, p.17). Dogs at war	**Indicators of metacognition**					
			Knowledge of cognition			**Regulation of cognition**		
			D	P	C	R	E	
Clarifies								
Infers	1. Deduces	1. That's pretty good, twenty minutes before the planes arrive! He could sense it with his ears, may be the smell of petrol or something. (c/c Evaluates)	√			√	√	
	2. Deduces	*2. It's basically talking about dogs and how good they are for the military forces because they can work in many different ways.*	√			√		
	3. Deduces	3. *Educated dogs detective - Explosives detection dogs*	√			√		
	4. Deduces meaning of *cache of weapons*	4. *A massive block of weapons – all these weapons*	√			√		
	5. Deduces meaning of *military*	5**.** *Probably like protectors; may be the warriors - the soldiers* (c/c Makes Connections)	√			√		
Analyses	1. Paraphrases; analyses	1. *The most mature and the best animal to have (…) because they are the smartest and can run the fastest. Dogs can also attack. Like I said before, they've got everything good about them (…) they're fast they can attack and a good sense of smell. (c/c* Makes Connections*)*	√			√	√	
Makes connections	1. Links – experience	1. Cross code from Infers no. 5 (includes modal and **metalanguage**)	√			√		
	2. Links – experience	2. Cross code from Analyses no.1 (includes modal and pause)	√			√	√	
Monitors								
Evaluates	1. Judges	1. Cross code from Infers no.1 (includes modal)	√			√		
Other possible reflections of metacognitive thinking			**Metalanguage**			M P		

Note. Abbreviations: M = modality; P = pause or non-word responses; **bold text** = metalanguage; green highlight = expressions of metacognitive knowledge and/or regulation of cognition; Links - experience = connects to existing knowledge; c/c = cross coding; ATAF adapted from Bannister-Tyrrell (2013); Klingner (2004); Schellings et al. (2006); Tarricone (2011); and Whitebread et al. (2009)

Adaptive Think-aloud Framework (ATAF) Section B: Assessment of critical thinking and metacognitive ability (Case-study child participant ID: 21 Michael) Text: Narrative								
Critical thinking	**Types of skills** observed e.g., predicts, clarifies, links, deduces	**Responses from Think Aloud** – text taken from Webb, J. (2001, p.24). Sailing to Atlantis: The Sinbad Chronicles	**Indicators of metacognition**					
			Knowledge of cognition			**Regulation of cognition**		
			D	P	C	R	E	
Clarifies	1. Attempts to clarify.	1. Probably 'darted' – very fastly – is fastly a word? No – very fast. Because I have heard the word darted a lot on the TV (…). I knew the meaning and then I worked it out from the sentence as well. (c/c Makes connections, Monitors strategies)	√	√		√	√	
	2.Clarifies	2. Oh so that's what – a wind surfer – hmm. I know what a wind surfer is. Isn't it like a surfboard with a **mast attached** to it? (c/c Makes Connections, Monitors)	√			√		
	3. Clarifies	3. Ah so it lives in the volcano. I'd laugh if it drops it! I think the bird is **circling on top of a volcano** ready for land. For food probably.	√			√	√	
Infers	1. Deduces meaning of downdraught	1. I guess 'downdrort' is the **wind that comes off its wings**. The wind whipped up little hurricanes – the 'downdrort' of its wings. The wind fits (…) the downdrort of its wings. If you put wind (…). Hmm it's a bird not a dragon.	√			√	√	
	2. Deduces size of bird	3. The rukh is a **massive bird**. I can tell that. Hopefully the rukh might actually be a dragon. Every feather was the size of a palm frond (read quickly and softly to himself) and a palm is massive. Yes because the feather which would have been massive. (chuckles and referred to a pen feather!)	√			√	√	
	3. Deduces meaning of frond	4. Probably from the stem upwards - the stem part of the palm.	√			√		
	4. Deduces the eases of lifting	5. No, because of the word effortlessly. **I can effortlessly** carry this (…) (c/c Makes Connections)	√			√		
	5. Deduces meaning of riding the thermals	6. I am not sure – the hot air. I have read the sentence three times and am not sure except for the fact it might be a type of wind. Because it is **riding the thermals when it is flying** and a bird doesn't fly anything (c/c Makes Connections). It would be a type of wind.	√			√	√	
Analyses	1. Analyses the reference to the small of rotting meat	1. Combination of rotting meat - I guess the rotting meat must be from the mouth and the damp feathers might be from the salt water. The rotting meat was because of the mouth – all the meat it has eaten recently and the damp feathers - because of the salt water.	√			√		
Makes connections	1. Links – experience	1. Cross code from Clarifies no.1 (includes modal and pause)	√	√		√		
	2. Links – text	2. Cross code from Infers no.5 (includes pause and **metalanguage**)	√			√		
	3. Links – text & experience	3. Cross code from Infers no. 6 (includes modal and **metalanguage**)	√			√	√	
Monitors	1. Reviews	1. Cross code from Clarifies no.1 (includes modal and pause)	√			√		

Adaptive Think-aloud Framework (ATAF) Section B: Assessment of critical thinking and metacognitive ability (Case-study child participant ID: 21 Michael) Text: Narrative							
Evaluates	1.Judges text	1. Ah that's a mistake! Cyn could just get out of the way (c/c Questions, Solves resolves)	√			√	√
Questions	1.Challenges	1. Cross code from Evaluates no.1 (includes modal and pause)	√			√	√
Solves, resolves	1. Solves	1. Cross code from Evaluates no.1 (includes modal and pause)	√			√	√
Other possible reflections of metacognitive thinking			**Metalanguage**			M S/t P	

Note. Abbreviations: M = modality; S/t = self talk; P = pause or non-word responses; **bold text** = metalanguage; green highlight = expressions of metacognitive knowledge and/or regulation of cognition; Links – text = connects to text; Links – experience = connects to existing knowledge; c/c = cross coding; ATAF adapted from Bannister-Tyrrell (2013); Klingner (2004); Schellings et al. (2006); Tarricone (2011); and Whitebread et al. (2009)

Adaptive Think-aloud Framework (ATAF) Section B: Assessment of critical thinking and metacognitive ability (Case-study child participant ID: 21 Michael) Text: Non-fiction								
Critical thinking	**Types of skills** observed e.g., predicts, clarifies, links, deduces	**Responses from Think Aloud** – text taken from Catchpole, H. (2003-2004, p.11). Bushfires: Preventing a natural disaster	**Indicators of metacognition**					
			Knowledge of cognition			**Regulation of cognition**		
			D	P	C	R	E	
Clarifies	1.Attempts to clarify	1. There is a change in the height of the sea temperature and the height of the Pacific Ocean. It has something to do with water. I don't know, may be the water in the in-land comes out to sea. The increase in sea temperature could mean more steam which means more rain, but how does that cause drought? What would be the problem with rising sea levels? I am not sure.	√	√		√		
	2. Attempts to clarify	2. I wonder why the term El Niño is used when Australians can't say it properly. I am not trying to offend. I am still wondering about the use of the term El Niño. (c/c Makes Connections, Question	√			√		
Infers	1.Deduces	1. It means little kid/ the child *(explains the pronunciation of the n and o with the symbol)*. Probably because it is littler than the other droughts - a little drought. (c/c Makes Connections)	√			√		
	2. Deduces	2. Debris is like rubbish or something, like in a war if a bomb explodes there is debris, something that is not supposed to be there. Rubbish from something. (c/c Makes Connections)	√			√	√	
Analyses	1. Analyses	1. The fire actually helps because it lets the seeds lying in the ground grow because of all the minerals left by the fire. Ah think of the seed like a shell, when you heat it and cool it very quickly it becomes very weak. It has been cool for a long time so in the heat it becomes weak so that the plant can reach out. (c/c Makes Connections, Evaluates)	√			√		
Makes connections	1. Links – experience	1. Cross code from Clarifies no.2 (includes modal)	√			√		
	2. Links – experience	2. Cross code from Infers no.1 (includes modal and metalanguage)	√			√		
	3. Links – experience	3. Cross code from Infers no. 2 (includes modal and metalanguage)	√			√		
Monitors								
Evaluates	1.Judges	1. They have a vocabulary error here. It should be speed, intensity and flame height (*Original doesn't have the word and*)	√			√	√	
	2. Judges	2. Cross code from Analyses no. 1 (includes modal and metalanguage)	√			√		
Questions								
Solves, resolves								
Other possible reflections of metacognitive thinking			**Metalanguage**			M S/t	P	

Note. Abbreviations: M = modality; S/t = self-talk; P = pause or non-word responses; **bold text** = metalanguage; green highlight = expressions of metacognitive knowledge and/or regulation of cognition; Links to experience = connects to existing knowledge; c/c = cross coding; ATAF adapted from Bannister-Tyrrell (2013); Klingner (2004); Schellings et al. (2006); Tarricone (2011); and Whitebread et al. (2009)

Adaptive Think-aloud Framework (ATAF) Section B: Assessment of critical thinking and metacognitive ability (Case-study child participant ID: 22 Christopher) Text: Narrative								
Critical thinking	Types of skills observed e.g., predicts, clarifies, links, deduces	**Responses from Think Aloud – text taken from O'Brien, J. (2013, p.7) When the lords of earth departed**	**Indicators of metacognition**					
			Knowledge of cognition			**Regulation of cognition**		
			D	P	C	R	E	
Clarifies	1. Attempts to clarify	1. Why are they trying to kill them – the goblins **and so forth** – and what did they do to start this war?				√		
Infers	1. Deduces meaning of depression in the ground	1**.** A hole, because he **clambered out**, which means that there was **like something in the ground**. (c/c Makes Connections)	√			√		
	2. Deduces why an arrow would be ineffective	2. Probably the magic of the dark sorcerer is really **powerful and could probably deflect it and it wouldn't affect him.**	√			√	√	
	3. Deduces mission was risky	3. You can tell this because he (*Lyndell*) spoke softly and was sad that he (*his friend*) could get himself killed.	√			√		
	4. Extrapolates	4. Distracting can also mean **like a suicide mission. In distracting he might get himself killed**. (c/c Makes Connections)	√			√		
	5. Deduces	5. Well I think what is happening is that the witches are trying to go in for **an aerial attack** but they have been shot down – very badly	√			√	√	
	6. Deduces	6. I think there is a war between good and evil and the soldiers are trying to **invade the castle** or something but this dark sorcerer is trying to **stop them from advancing**. (c/c Makes Connections, Evaluates)	√			√		
Analyses	1. Paraphrases, analyses	1. So far there is a war going on and these two friends were powering away when, like, a high lord, a high person in the war told the elf to go and distract the sorcerer and get himself killed, while some witches are getting shot down and he is going off with a bow and arrow but it won't really hurt him. He **could just deflect it.**	√			√	√	

Adaptive Think-aloud Framework (ATAF) Section B: Assessment of critical thinking and metacognitive ability (Case-study child participant ID: 22 Christopher) Text: Narrative							
Makes connections	1. Links, engages	1. Reminds me of this game that I have played called 'Legendary Wars'. It is pretty much that you have got a castle and a king and you have got little miners minding the mines to get you **resources to trade for the troops**. There's gollums and knights and so forth and then you have to try and destroy the dark side's castle or might destroy all their enemies.	√			√	
	2. Links - text	2. Cross code from Infers no. 1 (includes modal and **metalanguage**)	√			√	
	3. Links	3. Cross code from Infers no. 4 (includes modal and **metalanguage**)	√			√	
	4. Links	4. Cross code from Infers no. 6 (includes modal and **metalanguage**)	√			√	
Monitors							
Evaluates	1. Links	1.Cross code from Infers no. 6 (includes modal and **metalanguage**)	√			√	
Questions							
Solves, resolves							
Other possible reflections of metacognitive thinking			**Metalanguage**			M	

Note. Abbreviations: M = modality; **bold text** = metalanguage; green highlight = expressions of metacognitive knowledge and/or regulation of cognition; Links - text = connects to text; c/c = cross coding; ATAF adapted from Bannister-Tyrrell (2013); Klingner (2004); Schellings et al. (2006); Tarricone (2011); and Whitebread et al. (2009)

Adaptive Think-aloud Framework (ATAF) Section B: Assessment of critical thinking and metacognitive ability (Case- study child participant ID: 22 Christopher) Text: Non-fiction								
Critical thinking	Types of skills observed e.g., predicts, clarifies, links, deduces	**Responses from Think Aloud** – text taken from Catchpole, H. (2003-2004). Bushfires: Preventing a natural disaster (p.11)	**Indicators of metacognition**					
			Knowledge of cognition			**Regulation of cognition**		
			D	P	C	R	E	
Clarifies	1. Attempts to clarify	1. I wonder how the El Niño effect affects the drought.				√		
	2. As above	2. I am wondering about how they find out how high the fire is going to be and **so forth.**						
Infers	1. Deduces meaning of launching pad for fires	1. It was likely that there was going to be a fire there because it is so dry and hot and there **is flammable material lying around.** (c/c Makes Connections)	√			√	√	
Analyses	1. Analyses, paraphrases	1. Yes after the fire has wiped everything out, the plants make a **back-up generation** in case they get wiped out. It is so hot and it tells the seeds that there is a fire and once it is cooled down they know that the fire has been and gone and then they can rise up and start growing. (c/c Makes connections)	√			√		
Makes connections	1. Links – experience	1. […] fires were just showing everywhere – random times. Yesterday the **conditions were really extreme.** There were winds that were literally tossing people around and took the scaffolding off a building, hail the size of golf balls. It was **mayhem** everywhere! Lightning struck trees and it even hit an aeroplane but it landed safely.	√			√		
	2. Links – text	2. Cross code from Analyses no. 1 (includes modal and **metalanguage**)	√			√		
	3. Links – text	3. Cross code from Infers no. 1 (includes modal and **metalanguage**)	√			√	√	
Monitors								
Evaluates								
Questions								
Solves, resolves								
Other possible reflections of metacognitive thinking			**Metalanguage**			M		

Note. Abbreviations: M = modality; **bold text** = metalanguage; green highlight = expressions of metacognitive knowledge and/or regulation of cognition; Links – text = connects to text; Links - experience = connects to existing knowledge; c/c = cross coding; ATAF adapted from Bannister-Tyrrell (2013); Klingner (2004); Schellings et al. (2006); Tarricone (2011); and Whitebread et al. (2009)

Adaptive Think-aloud Framework (ATAF) Section B: Assessment of critical thinking and metacognitive ability (Case-study child participant ID: 24 Skye) Text: Narrative								
Critical thinking	**Types of skills** observed e.g., predicts, clarifies, links, deduces	**Responses from Think Aloud** – text taken from Webb, J. (2001, p.24). Sailing to Atlantis: The Sinbad Chronicles	**Indicators of metacognition**					
			Knowledge of cognition			**Regulation of cognition**		
			D	P	C	R	E	
Clarifies	1. Attempts to clarify	1. This might be happening in Afghanistan with a plane circling around, which would be why she is trying to look small. I am not sure about the word frond may be the palm in your hand and it is small. (c/c Makes Connections)	√			√		
	2. Questions	2. The rukh may be a bird because of the downdraught of its wings. I don't know why there are hurricanes of salt spray.(c/c Infers, Makes Connections)	√			√		
	3. Questions	3. I am not sure who Sinbad is. Maybe its her dad who was in the boat. He could be booming out instructions to help her. (c/c Makes Connections)	√			√		
Infers	1. Deduces	1. Rukh is probably a type of bird – maybe it's dangerous and she is worried and wants to know what is happening. (c/c Makes Connections)	√			√		
	2. Judges	2. This explains itself. She is on the ocean and in a boat.	√			√	√	
	3. Deduces	3. Maybe the mast is what is taken as well. Sinbad says to use the sail as a shield so the mast must have been in the air too. (c/c Makes Connections)	√			√		
	4. Deduces	4. The crater could be its nest. It is a large bird so it would need a nest the size of a crater. (c/c Makes Connections)	√			√		
	5. Deduces from previous points	5. She is probably high in the air and doesn't like the smell of its body.	√			√		
Analyses	1. Analyses	1. I am not sure of the word thermals – (from text – 'riding the thermals'. Maybe branches, it maybe something to do with temperature. No it couldn't be branches because they wouldn't be that high. It could be wind currents because it says that it flew higher riding the thermals – like riding waves. (c/c Makes Connections, Monitors, Evaluates)	√			√	√	
Makes connections	1. Links – experience	1. Cross code from Clarifies no.1 (includes modal and metalanguage)	√			√		
	2. Links – text	2. Cross code from Clarifies no.2 (includes modal)	√			√		
	3. Links – experience	3. Cross code from Clarifies no. 3 (includes modal and metalanguage)	√			√		
	4. Links – text	4. Cross code from Infers no. 1 (includes modal)	√			√		
	5. Links – text	5. Cross code from Infers no. 3 (includes modal)	√			√		
	6. Links – experience	6. Cross code from Analyses no. 1 (includes modal and metalanguage)	√			√	√	
Monitors	1. Reviews	1. Cross code from Analyses no. 1 (includes modal and metalanguage)	√			√	√	
Evaluates	1. Examines	1. Cross code from Analyses no. 1 (includes modal and metalanguage)	√			√	√	

Adaptive Think-aloud Framework (ATAF) Section B: Assessment of critical thinking and metacognitive ability (Case-study child participant ID: 24 Skye) Text: Narrative							
Questions							
Solves, resolves							
Other possible reflections of metacognitive thinking			**Metalanguage**			M	

Note. Abbreviations: M = modality; **bold text** = metalanguage; green highlight = expressions of metacognitive knowledge and/or regulation of cognition; Links – experience = connects to existing knowledge; Links - text = connects to text; c/c = cross coding; ATAF adapted from Bannister-Tyrrell (2013); Klingner (2004); Schellings et al. (2006); Tarricone (2011); and Whitebread et al. (20

Adaptive Think-aloud Framework (ATAF) Section B: Assessment of critical thinking and metacognitive ability (Case-study child participant ID: 24 Skye) Text: Non-fiction								
Critical thinking	Types of skills observed e.g., predicts, clarifies, links, deduces	**Responses from Think Aloud** – text taken from Catchpole, H. (2003-2004, p.11). Bushfires: Preventing a natural disaster	**Indicators of metacognition**					
			Knowledge of cognition			**Regulation of cognition**		
			D	P	C	R	E	
Clarifies	1. Attempts to clarify	1. I don't know what the El Niño is. (*Looked back at the paragraph*) May be it is like something to do with flooding when the ocean rises.	√			√		
	2. Attempts to clarify	2. This is probably not true but may be when the sea gets hotter there is more salt in it so it is harder to drain, so it's harder to put on plants and you can't drink as much. I don't know.	√			√		
	3. Attempts to clarify	3. May be the Pacific Ocean goes down in height – I was thinking up.				√		
	4. Attempts to clarify	4. Cross code from Infers no. 4 (includes modal and metalanguage)	√			√		
Infers	1.Deduces meaning	1. Wait oh because the areas dry out and it is easier to catch fire and because the leaves are dry they are easy to catch fire, but not green leaves. (c/c Makes Connections)	√			√		
	2. Explains debris	2. I used to think that it was a name. Leaf litter and there is debris - it could be fallen bark	√			√		
	3. Extrapolates	3. It is pretty cool because if you have planted a seed and it has taken a long time to grow you could have a tiny little shrub and burn it and put it out and the seed would grow. (c/c Making connections, Evaluates)	√			√		
	4. Deduces	4. Sometimes - it depends what I am reading – less in factual, but when it mentioned drought I thought of a desert. Maybe El Niño is something to do with flooding when the ocean rises. (c/c Makes Connections, Clarifies)	√			√		
Makes connections	1. Links – experience	1. Cross code from Infers no.1 (includes modal and pause)	√			√		
	2. Links – text	2. Cross code from Infers no. 3 (includes modal and metalanguage)	√			√		
Other possible reflections of metacognitive thinking			**Metalanguage**			M S/t P		

Note. Abbreviations: M = modality; P = pause or non-word responses; **bold text** = metalanguage; green highlight = expressions of metacognitive knowledge and/or regulation of cognition; Links – experience = connects to existing knowledge; Links - text = connects to text; c/c = cross coding; ATAF adapted from Bannister-Tyrrell (2013); Klingner (2004); Schellings et al. (2006); Tarricone (2011); and Whitebread et al. (2009)

Adaptive Think-aloud Framework (ATAF) Section B: Assessment of critical thinking and metacognitive ability (Case-study child participant ID: 20 Miriam) Text: Non-fiction								
Critical thinking	**Types of skills** observed e.g., predicts, clarifies, links, deduces	**Responses from Think Aloud** – text taken from Catchpole, H. (2003-2004, p.11). Bushfires: Preventing a natural disaster	**Indicators of metacognition**					
			Knowledge of cognition			**Regulation of cognition**		
			D	P	C	R	E	
Clarifies	1. Attempts to clarify.	1. Maybe the El *Niño* effect is caused by the **natural disasters and droughts** and stuff. (c/c Makes Connections)	√			√		
	2. Questions	2. You would think that the El *Niño* would **affect the weather in the other way** – more water and not less. Does the Pacific Ocean get lower or higher? I think that it would get lower because how **would it create drought** if the ocean is getting higher. (c/c Evaluates)	√			√		
Infers	1.Deduces	1. What does debris mean? (…)Probably the left overs from the bush fires. It is a place of high risk of there being bush fires – it's the place where there is bound to be bush fires. Because of the drought. It's all dry. (c/c Makes Connections)	√			√	√	
	2. Judges	2. It's pretty amazing that the seeds which may have **remained unopened** in the soil for years – and didn't open even with the water. They are **responding to the heat**. Because they have been there for years they are so old that in the heat they just crack. The plant grows. (c/c Makes Connections, Evaluates)	√			√	√	
	3 .Deduces	3. It's about drought and how it can create fires and how the El Niño affects that – and what **temperature is best for fire fighters** and how this can help them.	√			√		
	4. Extrapolates	Everything is important. Well you have to back burn to stop fires which means you have to create a fire to stop fire. It helps the **vegetation.** (c/c Makes Connections, Evaluates)	√			√	√	
Analyses								
Makes connections	1. Links – experience	1. Cross code from Clarifies no.1 (includes modal and **metalanguage**)	√			√		
	2. Links – experience	2. Cross code from Infers no. 1 (includes modal and pause and **metalanguage**)	√			√	√	
	3. Links – experience	3. Cross code from Infers no. 2 (includes modal and **metalanguage**)	√			√	√	
	4. Links – experience	4. Cross code from Infers no. 4 (includes modal and **metalanguage**)	√			√		
Monitors								
Evaluates	1. Examines, judges	1. Cross code from Clarifies no. 2 (includes modal and **metalanguage**)	√			√		
	2. Examines, judges	2. Cross code from Infers no. 2 (includes modal and **metalanguage**)	√			√	√	

Adaptive Think-aloud Framework (ATAF) Section B: Assessment of critical thinking and metacognitive ability (Case-study child participant ID: 20 Miriam) Text: Non-fiction							
	3. Judges	3. Cross code from Infers no. 4 (includes modal and **metalanguage**)	√			√	√
Questions							
Solves, resolves							
Other possible reflections of metacognitive thinking			**Metalanguage**			M S/t	P

Note. Abbreviations: M = modality; S/t = self-talk; P = pause or non-word responses; **bold text** = metalanguage; green highlight = expressions of metacognitive knowledge and/or regulation of cognition; Links – experience = connects to existing knowledge; c/c = cross coding; ATAF adapted from Bannister-Tyrrell (2013); Klingner (2004); Schellings et al. (2006); Tarricone (2011); and Whitebread et al. (2009)

Adaptive Think-aloud Framework (ATAF) Section B: Assessment of critical thinking and metacognitive ability (Case-study child participant ID: 20 Miriam) Text: Narrative								
Critical thinking	**Types of skills** observed e.g., predicts, clarifies, links, deduces	**Responses from Think Aloud** – text taken from Webb, J. (2001, p.24). Sailing to Atlantis: The Sinbad Chronicles	**Indicators of metacognition**					
			Knowledge of cognition			**Regulation of cognition**		
			D	P	C	R	E	
Clarifies	1. Attempts to clarify.	1. Well, I am wondering what the ruck is at first that circled above him. (...) maybe it is a type of bird. And maybe he is in the bush or something and the bird circled above him. Maybe the bird is magical and it has certain powers. (c/c Making connections)	√			√		
	2. Questions	2. I am not quite sure where it is set and everything, because it hasn't actually told me. It has just told me that a bird has circled above.	√			√		
	3.Clarifies meaning	3. '*Down drort'* of its wings? Maybe it is the circle that it makes or something– something to do with down. (pronounces downdraught as 'down drort')	√			√		
	4. Clarifies	4. The crater means the entrance to the volcano – right?				√		
Infers	1. Deduces meaning	1. Gigantic cruel talons - I know what gigantic, cruel means. Talons – is it like his claws? Probably, because it was lifting them up with his gigantic talons – what else would he be lifting them up with! (c/c Making connections)	√			√	√	
	2. Judges	2. So I now realise that she is in the sea or water and she is unable to surf so she is drifting. Because it says spearing her windsurfer with its talons (…) and also it says Cyn and her craft out of the water, so it is lifting her out of the water. (c/c Makes Connections)	√			√		
	3 .Deduces lifting is not difficult	3. No because of the word effortlessly	√			√		
	4. Deduces	4. It is about a girl named Cyn who was taking lessons on wind surfing when a big, giant bird came down and tried to take her and took her and her boat to the volcano. Well maybe – this is a weird thing, maybe because he wanted her to look after, so he is taking her into his home - or eat her. Maybe to eat her.	√			√	√	
	5. Predicts	5. So I'm guessing the next scene is that someone is going to get hurt. I didn't know that the bird is giant at first.	√			√		
	6. Deduces	6. Maybe Sinbad was her instructor for the windsurfing. So maybe Sinbad is going to come and save her from the bird. (re reads "And tie yourself to the mast".) I'm pretty sure maybe the bird is going to lift out the boat and take it to its nest… I will come for you.	√			√		
	7. Deduces	7. I think the bird may live in the volcano. It would probably be the home for it because it is giant. It wouldn't be able to fit in a nest in a tree or anything. (c/c Making connections)	√			√	√	

Adaptive Think-aloud Framework (ATAF) Section B: Assessment of critical thinking and metacognitive ability (Case-study child participant ID: 20 Miriam) Text: Narrative								
Analyses	1. Analyses	1. Obviously the smell was not very good and where it says rotting meat (…)does this mean that the bird was hurt and something happened to it? It's hard to say. It says damp feathers and rotting meat which basically explains the bird - dead. Its either that or it could be that it drifted them up to a place that has rotting meat and damp feathers for some reason. Well since it says effortlessly it probably means that the bird didn't get hurt because it wasn't, but there was probably something else horrible there, because it says rotting meat and damp feathers. It may be actually something else – but I don't know what. (Makes Connections, Monitors, Evaluates)	√			√	√
Makes connections	1. Links	I. don't know what thermal means. I will read the sentence "The great bird flew higher and higher riding the thermals" riding the thermals so it is riding – maybe it is part of the boat because it is flying with the boat underneath it.	√	√		√	
	2. Links – experience	2. Cross code from Clarifies no.1 (includes modal and pause and metalanguage)	√			√	
	3. Links – experience	3. Cross code from Infers no. 1 (includes modal and metalanguage)	√			√	
	4. Links – text	4. Cross code from Infers no. 2 (includes modal and pause and metalanguage)	√			√	
	5. Links – experience	5. Cross code from Infers no. 7 (includes modal and metalanguage)	√			√	√
	6.Links – text	6. Cross code from Analyses no. 1 (includes modal and pause and metalanguage)	√			√	√
Monitors	1. Reviews	1. Cross code from Analyses no. 1 (includes modal and pause and metalanguage)	√			√	
Evaluates	1. Examines	1. Cross code from Analyses no. 1 (includes modal and pause and metalanguage)	√			√	√
Other possible reflections of metacognitive thinking			**Metalanguage**			M S/t	P

Note. Abbreviations: M = modality; P = pause or non-word responses; **bold text** = metalanguage; green highlight = expressions of metacognitive knowledge and/or regulation of cognition; Links Links - experience = connects to existing knowledge; Links - text = connects to text; c/c = cross coding; ATAF adapted from Bannister-Tyrrell (2013); Klingner (2004); Schellings et al. (2006); Tarricone (2011); and Whitebread et al. (2009)

Appendix 33. Adaptive Think-aloud Framework Section B: Converted scores out of 100

Child ID and text type	Number of responses from TA sample	Critical thinking skills								Metacognition								
										Knowledge of cognition				Regulation of cognition				
		Cl	Infers	Analyse	Makes connections	Monitors	Evaluates	Questions	Solves, resolves	D	P	C	Meta-lang	R	E	Modal	Self talk	Pauses or non-word sounds
9 N	11		.45	.09	.45					1.0			.27	1.0		.45		
9 F	6		.67		.33					1.0			.60	.83		.33		
17 N	21	.14	.43	.05	.38					.95			.43	.95		.76		.67
17 F	9		.56	.11	.18		.11			1.0			.44	1.0	.33	.78		.33
21 N	16	.19	.31	.06	.19	.06	.06	.06	.06	1.0	.13		.50	1.0	.56	1.0	.13	.63
21 F	10	.20	.20	.10	.30		.20			1.0	.10		.70	1.0	.20	1.0		
22 N	13	.08	.46	.08	.31		.08			.92			.92	1.0		.92		
22 F	7	.29		.14	.43					.71			.86	1.0	.29	.71		
24 N	17	.18	.29	.06	.35	.06	.06			1.0			.65	1.0	.29	1.0	.06	
24 F	10	.30	.40		.20					.90			.70	1.0		1.0		.20
20 N	20	.15	.35	.05	.30	.05	.05			1.0			.80	1.0	.35	.90		.40
20 F	13	.15	.31		.31		.23			1.0			.92	1.0	.54	1.0	.08	.15

Note. Abbreviations = In column one N = narrative and F = factual text; Cl = Clarifies; Analyse = Analyses; Meta-lang = Metalanguage; D = Declarative knowledge; P = Procedural knowledge; C = Conditional knowledge; Metalan = Metalanguage; R = Regulation; E = Metacognitive experience; yellow highlight is .85 or above

Appendix 34. Adaptive Think-aloud Framework Section B: Summary

1D: 9 Dominic (11 Narrative observations) **Critical thinking:** Infers (.45); Makes connections (.45); Analyses (.09) **Knowledge of cognition:** Declarative Reasoning (1.0); Metalanguage (.27) **Regulation of cognition:** Regulates (1.0); Modality (.45)
ID: 9 Dominic (Non-fiction observations) **Critical thinking:** Infers (.67); Makes connections (.33) **Knowledge of cognition:** Declarative Reasoning (1.0); Metalanguage (.60) **Regulation of cognition:** Regulates (.83); Modality (.33)
1D: 17 Richard (21 Narrative observations) **Critical thinking:** Infers (.43) Makes connections (.38); Clarifies (.14); Analyses (.05) **Knowledge of cognition** Declarative Reasoning (.95) ;Metalanguage (.43) **Regulation of cognition** Regulates (.95); Modality (.76); Pauses or non-word responses (.67)
ID: 17 Richard (9 Factual observations) **Critical thinking:** Infers (.56); Makes connections (.18); Analyses (.11); Evaluates (.11) **Knowledge of cognition** Declarative Reasoning (1.0); Metalanguage (.44) **Regulation of cognition** Regulates (1.0); Experiences (.33); Modality (.78); Pauses or non-word responses (.33)
1D: 21 Michael (16 Narrative observations) **Critical thinking:** Infers (.31); Makes connections (.19); Clarifies (.19) and Analyses, Evaluates, Questions, Monitors & Solves/resolves (each .06) **Knowledge of cognition**: Declarative Reasoning (1.0); Procedural knowledge (.13); Metalanguage (.50) **Regulation of cognition**: Regulates (1.0); Experiences (.56); Modality (1.0); Self talk (.13); Pauses or non-word responses (.63)
ID: 21 Michael (10 Non-fiction observations) **Critical thinking:** Makes connections(.30); Infers (20); Clarifies (20); Evaluates (20); Analyses(10) **Knowledge of cognition**: Declarative Reasoning (1.0); Procedural knowledge (.10); Metalanguage (.70) **Regulation of cognition**: Regulates (1.0); Experiences (.20); Modality (1.0)
1D: 22 Christopher (13 Narrative observations) **Critical thinking:** Infers (.46); Makes connections(.31), Clarifies, Analyses; Evaluates (each .08) **Knowledge of cognition:** Declarative Reasoning (.92); Metalanguage (92) **Regulation of cognition:** Regulates (1.0); Modality (.92)
ID: 22 Christopher (7 Non-fiction observations) **Critical thinking:** Makes connections (.43); Clarifies (.29); Analyses (.14) **Knowledge of cognition:** Declarative Reasoning (.71); Metalanguage (.86) **Regulation of cognition:** Regulates (1.0); Experiences (.29); Modality (.71)
1D: 24 Skye (17 Narrative observations) **Critical thinking:** Makes connections (.35); Infers (.29); Clarifies (.18); Monitors (.06); Evaluates (.06) **Knowledge of cognition**: Declarative Reasoning (1.0); Metalanguage (.65) **Regulation of cognition:** Regulates (1.0); Experiences (.29); Modality (1.0); Self talk (.06)
ID: 24 Skye (10 Non-fiction observations) **Critical thinking:** Infers (.40); Clarifies (.30); Makes connections (.20) **Knowledge of cognition:** Declarative Reasoning (.90); Metalanguage (.70) **Regulation of cognition** : Regulates (1.0); Modality (1.0); Pauses or non-word responses (.20)
1D: 20 Miriam (20 Narrative observations) **Critical thinking:** Infers (.35); Makes connections (.30); Clarifies (.15); Analyses (.05); Monitors (.05); Evaluates (.05) **Knowledge of cognition**: Declarative Reasoning (1.0); Metalanguage (.80) **Regulation of cognition:** Regulates (1.0); Experiences (.35); Modality (.90); Pauses or non-word responses (.40)
ID: 20 Miriam (13 Non-fiction observations) **Critical thinking:** Infers (.31),Makes connections (.31); Evaluates (.23); Clarifies (.15) **Knowledge of cognition:** Declarative Reasoning (1.0); Metalanguage (.92) **Regulation of cognition** : Regulates (1.0); Experiences (.54); Modality (1.0); Self-talk (.15)

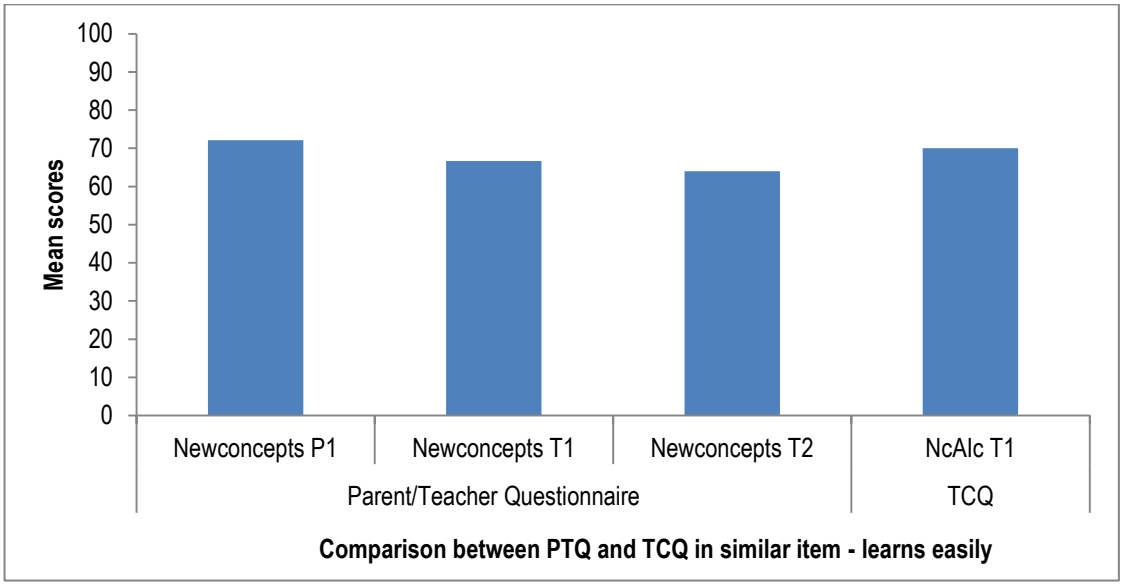
Appendix 35 Parent/Teacher Questionnaire (PTQ) SPSS coding and references for items/traits that can be observed in GLD (2e)

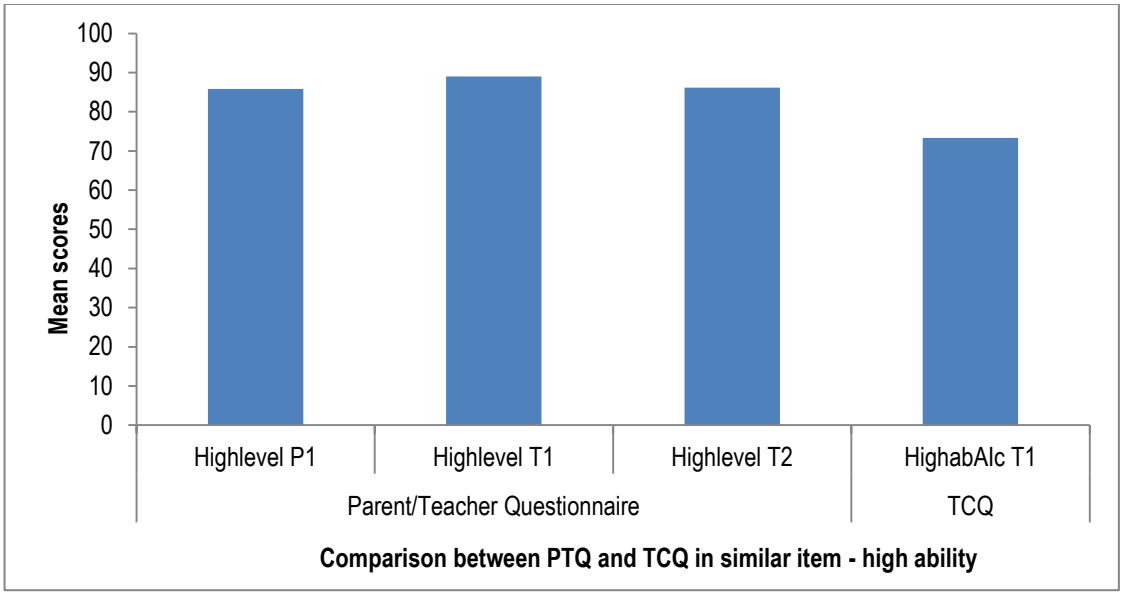
Categories	Coding for SPSS	
Potential		
1 Learns new concepts very easily (Nielsen, 2002)	Newconcepts1	
2 Has a high level of talent in at least one area – (Nielsen,2002; Potential Plus UK, 2014–2017)	Highlevel2	
3 Shows real enthusiasm for learning and exploring things in depth (Neihart,2008; Rogers, 2012)	Learningenthusiasm3	
4 Has an in-depth knowledge of an area of high interest (Nielsen, 2002; Rogers, 2012; Whitmore,1980)	Indepthknowledge4	
5 Has verbal communication skills beyond his/her years (Nielsen, 2002; Rogers, 2012)	Verbalcommunication5	
6 Has strong reasoning and problem solving skills (Neihart,2008; Nielsen, 2002; Reis,1989)	Strongreasoning6	
7 Asks in-depth and challenging questions (Montgomery, 2009; Rogers, 2012)	Indepthquestioning7	
8 Is highly creative (Geake, 2009; Neihart, 2008; Nielsen, 2002; Rogers, 2012)	Highlycreative8	
Cognitive style		
1 Prefers to learn step-by-step (Rogers, 2012)	Sequentiallearner1	Reversed
2 Grasps the 'big picture' instead of learning step by step (Geake, 2009; Nielsen, 2002; Rogers, 2012)	Graspswhole2	
3 Remembers verbal information easily (Potential Plus UK, 2014-2017; Rogers, 2012)	Verbalrecall3	
4 Prefers to see it, in order to get a better understanding	Visualunderstanding4	
5 Follows verbal instructions easily (Rogers, 2012)	Verbalinstructions5	
6 Has difficulty in recalling what has been finished and what still needs to be done (CogMed, 2014; Nielsen, 2002)	Keepingtrack6	Reversed
7 Takes time to get things finished (Nielsen, 2002; Potential Plus UK, 2014–2017)	Takestime7	Reversed
8 Can be forgetful (CogMed, 2014; Nielsen, 2002; Rogers, 2012)	Forgetful9	Reversed
9 Can have difficulty in planning and organising (Neihart, 2008; Nielsen, 2002)	Planningorganising10	Reversed
10 Sustains attention to complete a task (CogMed, 2014; Nielsen, 2002	Sustainsattention11	
11 Finds it challenging to remember instructions given as a sequence of steps (CogMed, 2014; Nielsen, 2002)	Rememberinstructions12	Reversed
Achievement		
1 Achievement results at school can vary (Nielsen, 2002; Rogers, 2012; Wormald, 2015)	Schoolresults1	
2 Explains his/her ideas clearly (Rogers, 2012)	Explainsclearly2	Reversed
3 Enjoys doing repetitive tasks e.g., the same types of homework	Repetitivetasks3	
4 Has difficulties in handwriting and presentation (Neihart, 2008; Nielsen, 2002)	Handwriting4	
5 Needs to be actively engaged in learning (at school or at home) (Rogers, 2012)	Activeengagement5	

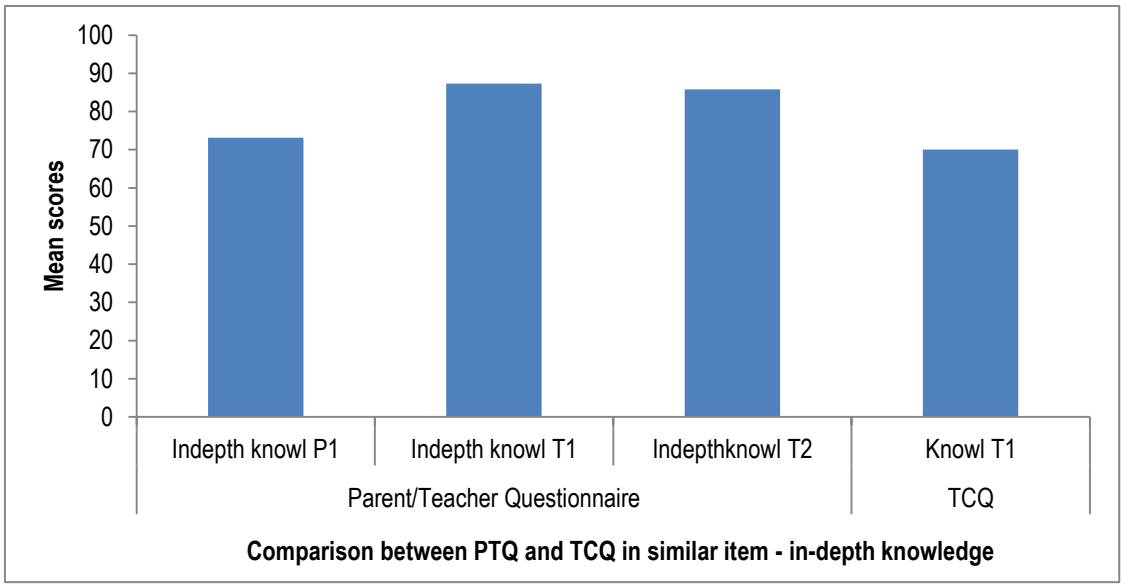
Categories	Coding for SPSS	
Achievement		
6 Doesn't always feel motivated by school work (Neihart, 2008; Rogers, 2012; Whitmore,1980)	Motivationissues6	
7 Experiences challenges with reading comprehension (Neihart, 2008; Potential Plus UK, 2014–2017)	Readingcomprehension7	
8 Experiences challenges in mathematics (Neihart, 2008; Potential Plus UK, 2014–2017)	Mathematics8	
9 Shows a gap between verbal ability and written expression (Assouline et al. 2010)	Verbalwritinggap9	
10 Shows proficient computer skills Proficiency in any one area (Potential Plus UK, 2014–2017)	Computerskills10	Reversed
Interpersonal relationships		
1 Likes plenty of time to reflect and recharge (Rogers, 2012)	Reflectiontime1	Reversed
2 Is energised and 'comes to life' in the company of others (Rogers, 2012)	Preferscompany2	
3 Prefers his/her own company (Rogers, 2012)	Prefersowncompany3	Reversed
4 Enjoys playing with peers (Whitmore, 1980)	Enjoyspeers4	
5 Is capable of setting up situations or making adjustments for own advantage (Nielsen, 2002; Rogers, 2012)	Setsupsituations1	
6 Shows leadership skills (Rogers, 2012)	Leadership7	
Intrapersonal relationships		
1 Is sensitive (Neihart, 2008; Rogers, 2012; Whitmore, 1980)	Sensitive1	
2 Is a perfectionist and worries about making mistakes (Neihart, 2008; Rogers, 2012)	Perfectionist2	
3 Can give up on a task if frustrated (Neihart, 2008; Rogers, 2012)	Givesup3	Reversed
4 Can be self-critical (Neihart, 2008; Rogers, 2012)	Selfcritical4	
5 Can experience anxiousness (Neihart, 2008), Rogers , 2012; Whitmore,1980)	Anxiousness5	
6 Likes to work hard to achieve a goal e.g., projects, music practice (Renzulli, 2010; Rogers, 2012)	Goaloriented6	
7 Can place an excessive demand on himself/herself through being so motivated or 'driven' (Potential Plus UK, 2014–2017; Whitmore, 1980)	Excessiveselfdemand7	

Note. References include research-based and anecdotal

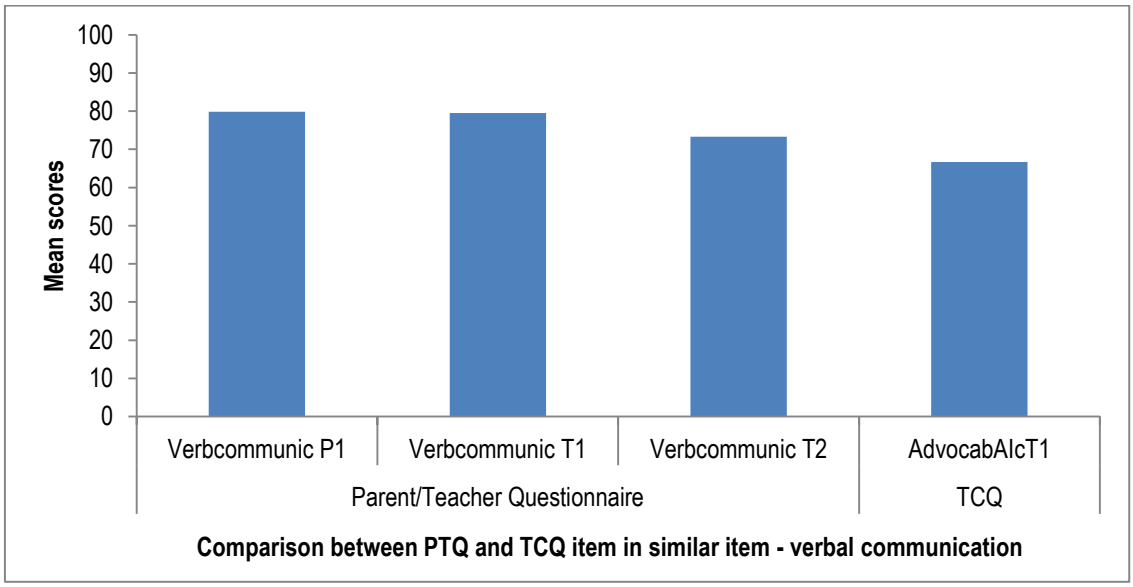
Appendix 36. Graphs: Comparisons between PTQ and TCQ



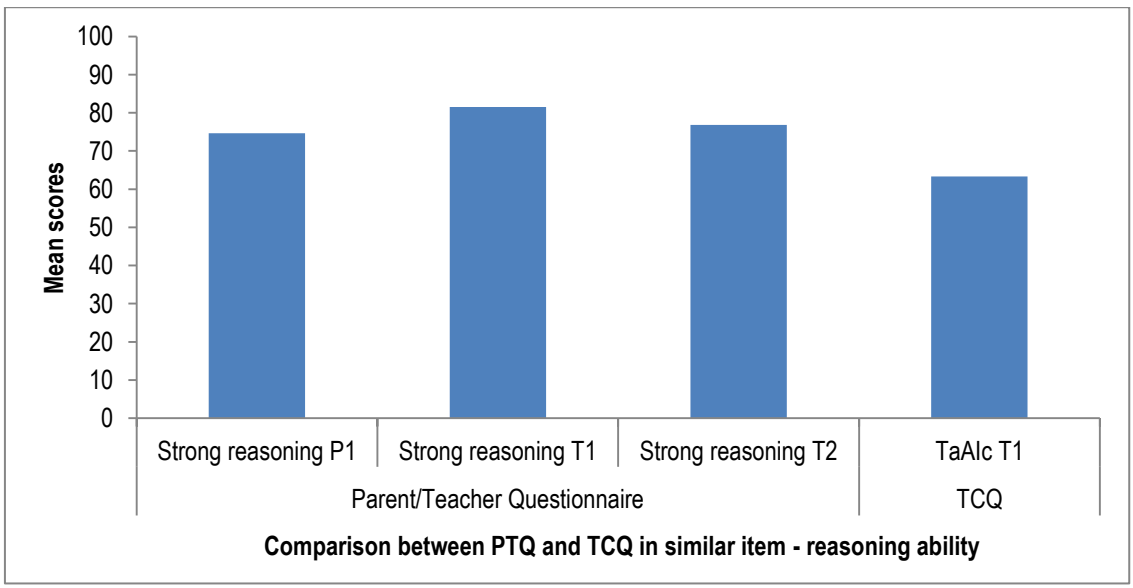




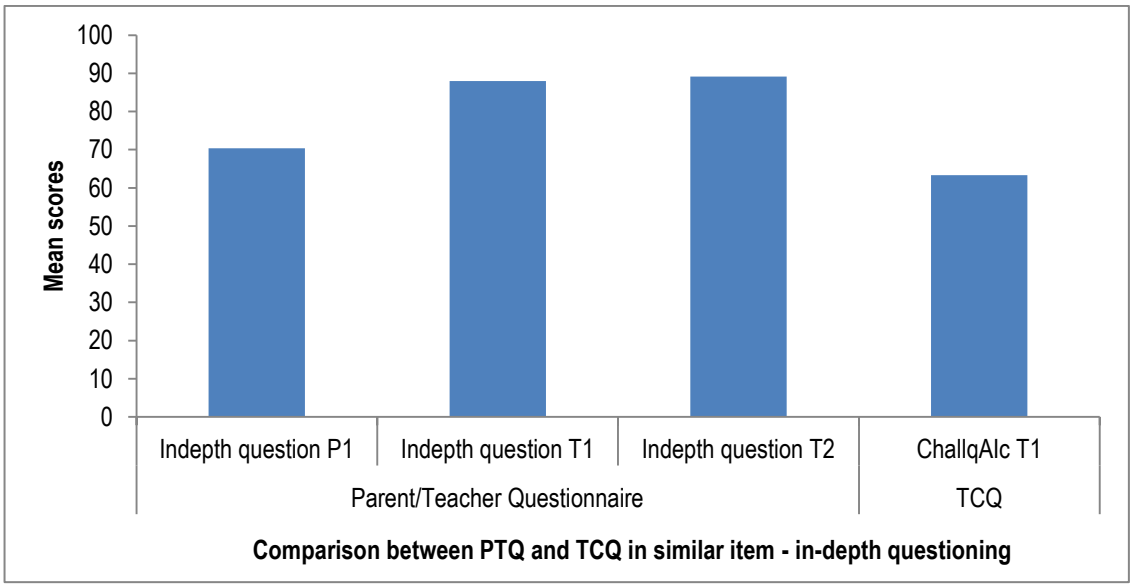
Comparison between PTQ and TCQ in similar item - in-depth knowledge



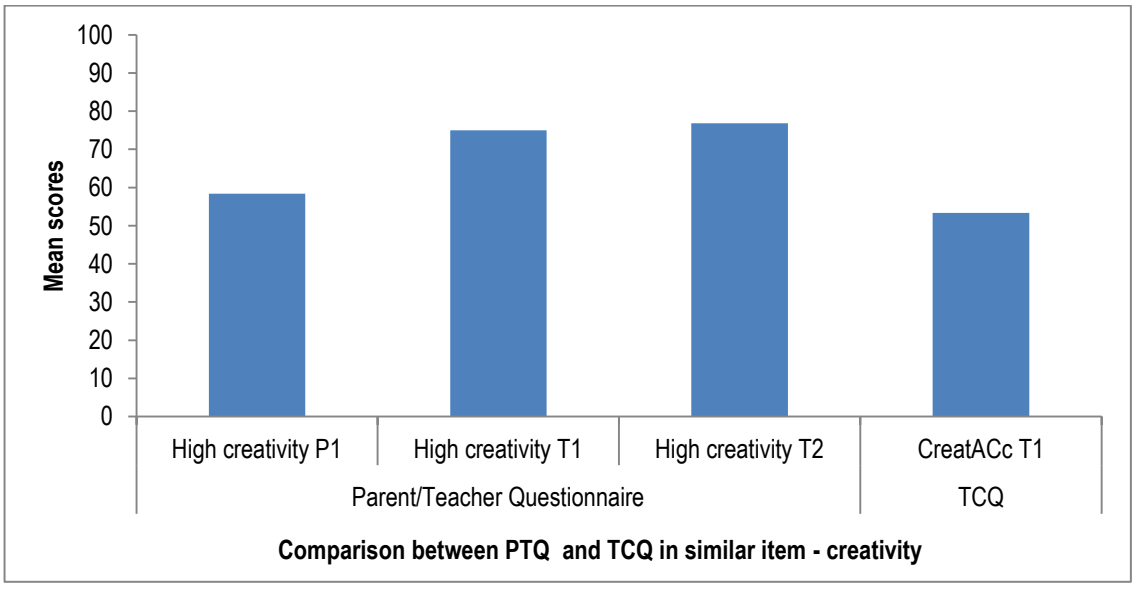
Comparison between PTQ and TCQ item in similar item - verbal communication



Comparison between PTQ and TCQ in similar item - reasoning ability



Comparison between PTQ and TCQ in similar item - in-depth questioning



Comparison between PTQ and TCQ in similar item - creativity

Appendix 37. Parent/Teacher Questionnaire (PTQ) Graphs of parent (s) and teacher perceptions

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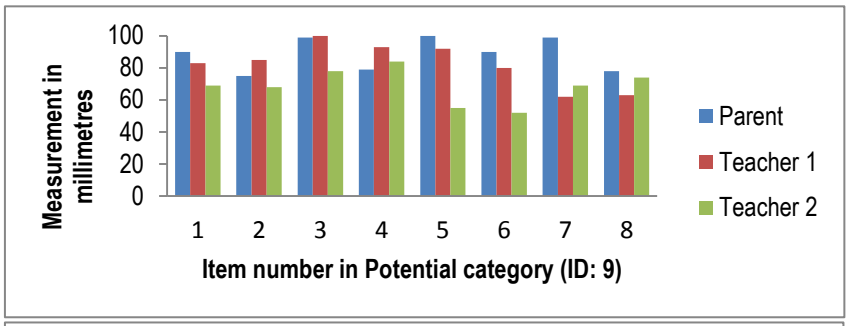

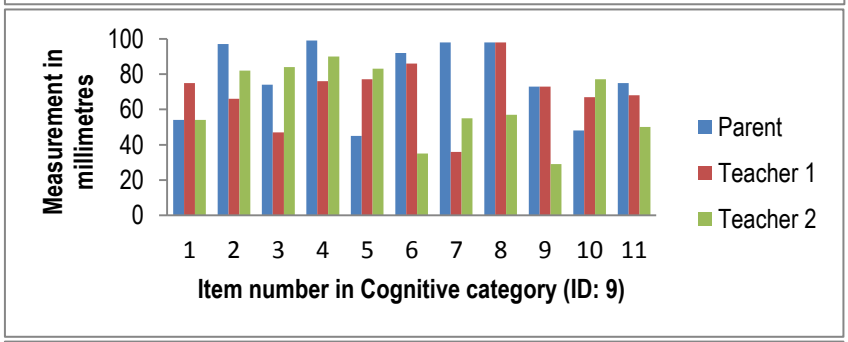

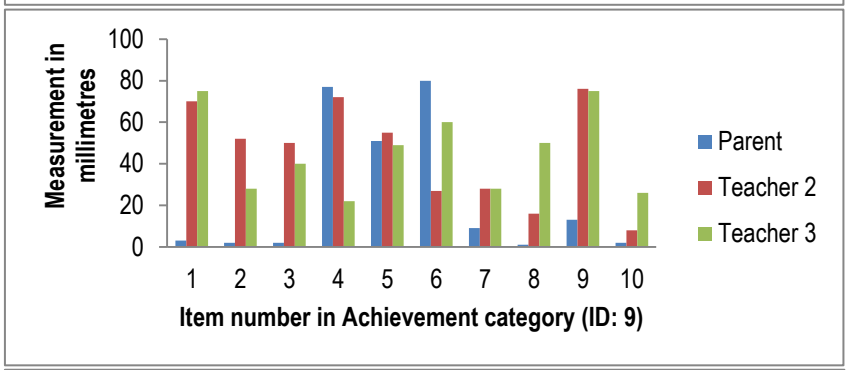

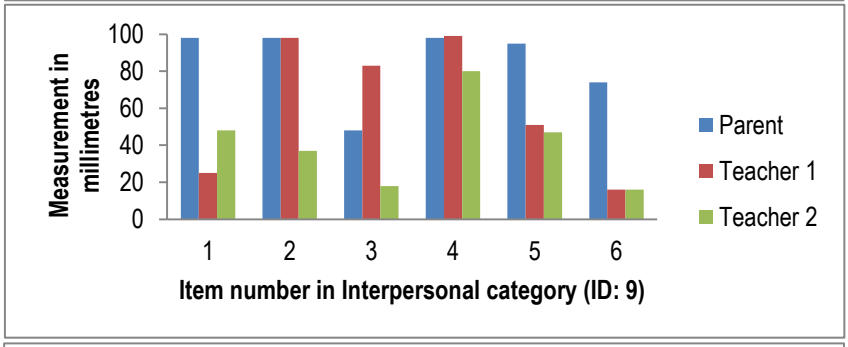

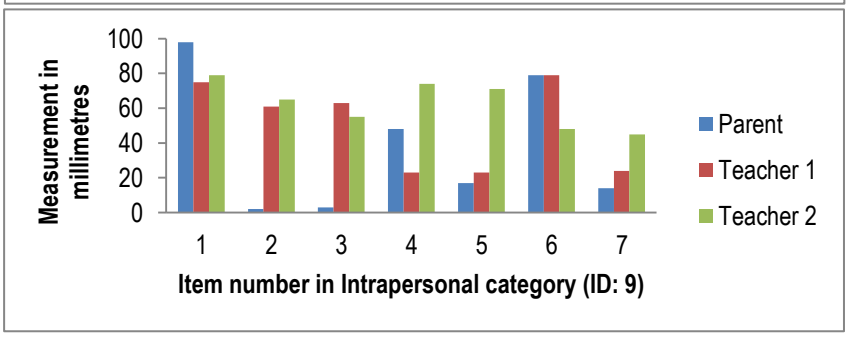

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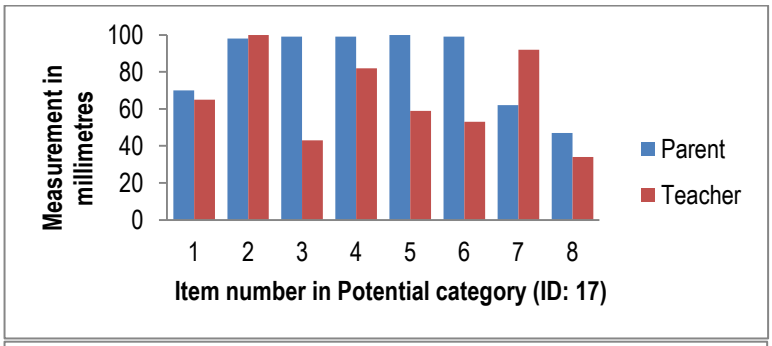

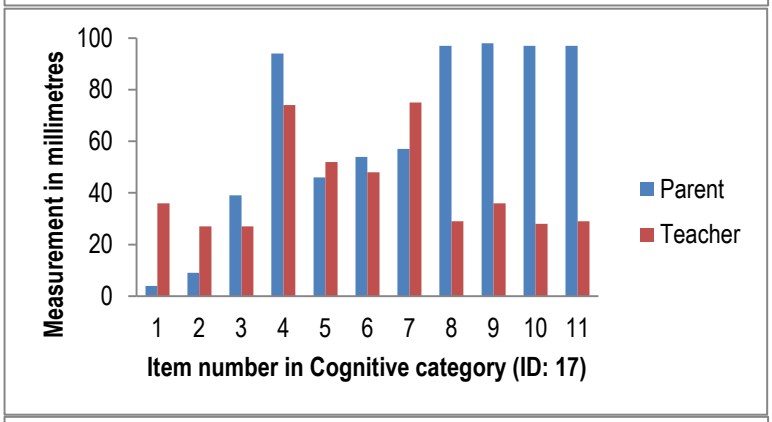

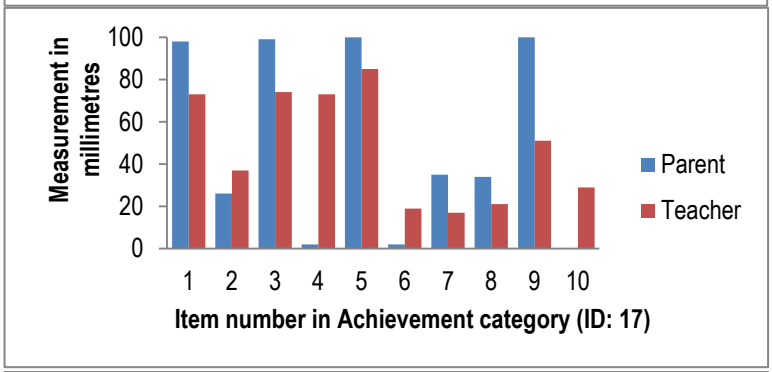

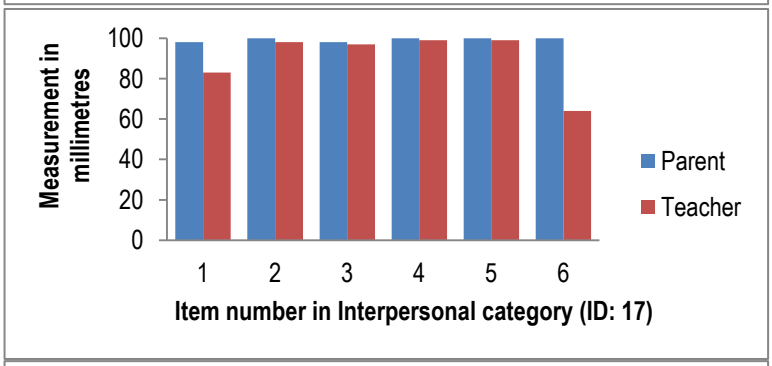

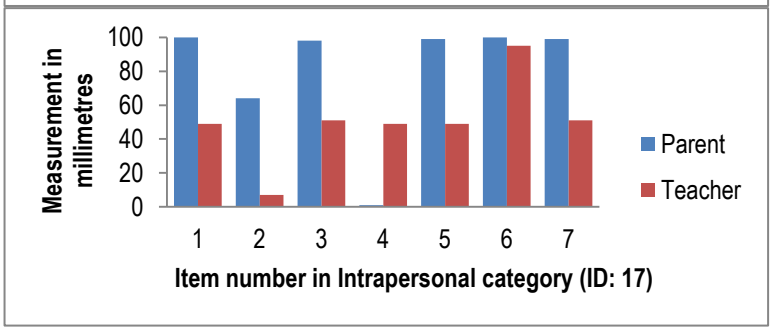

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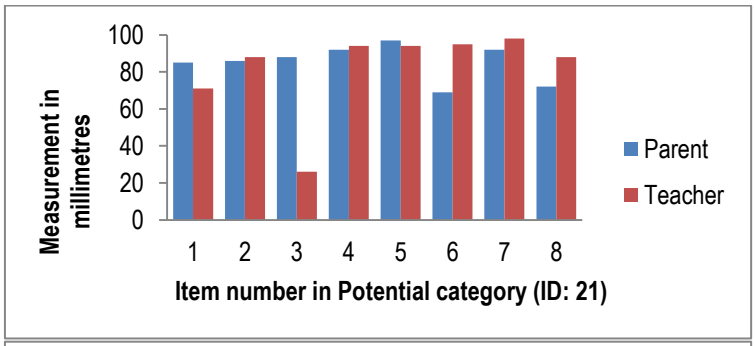

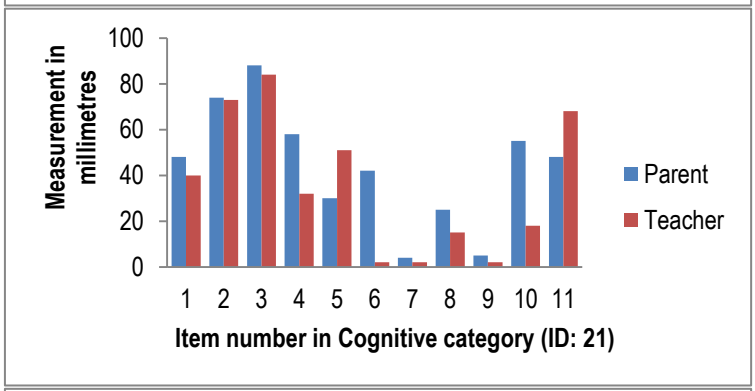

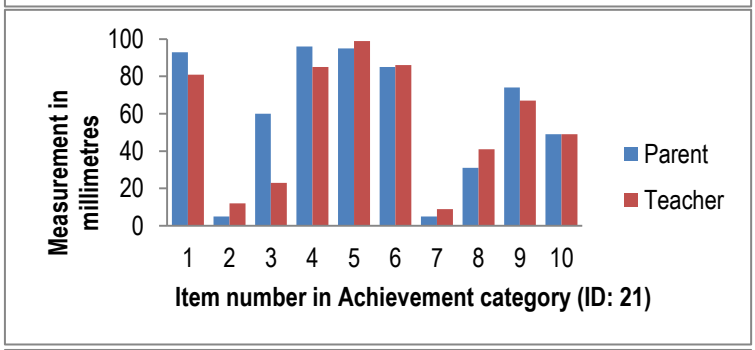

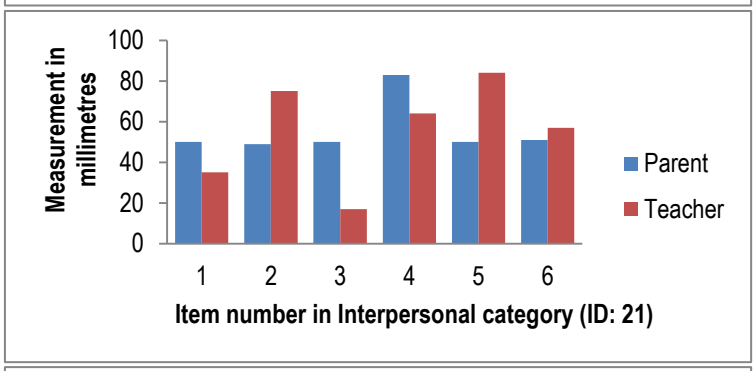

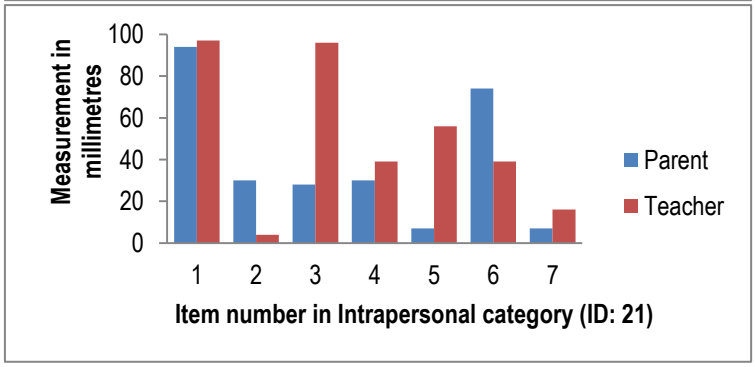

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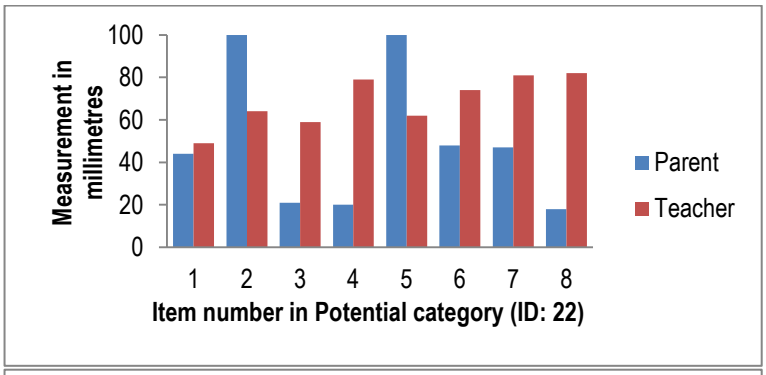

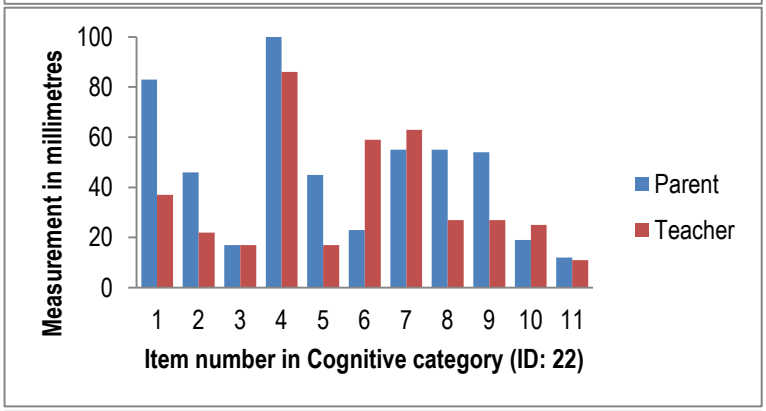

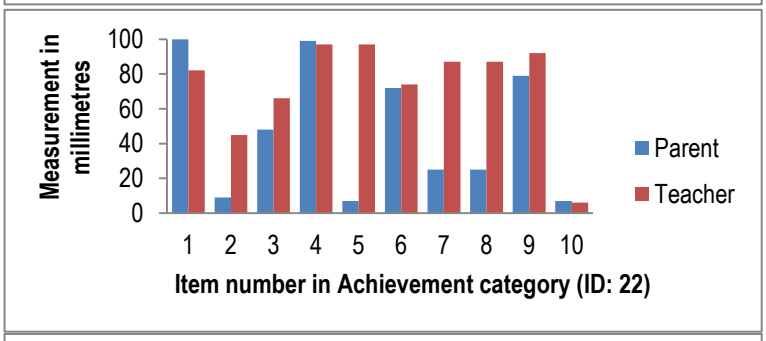

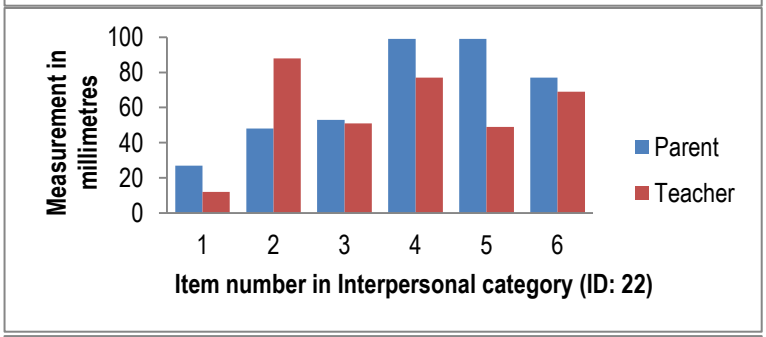

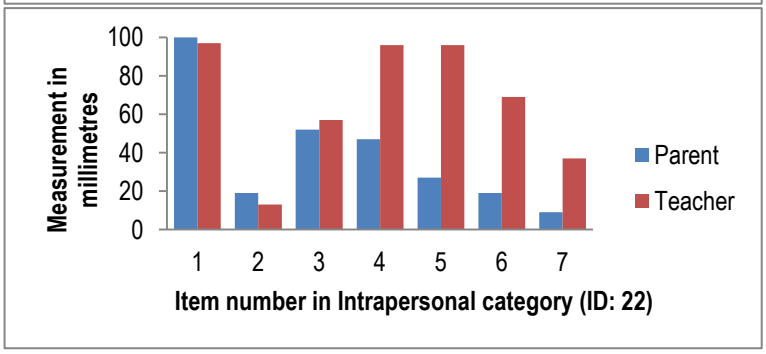

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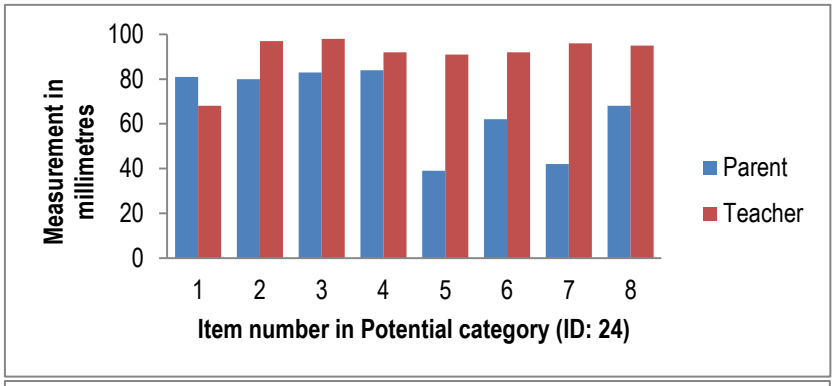

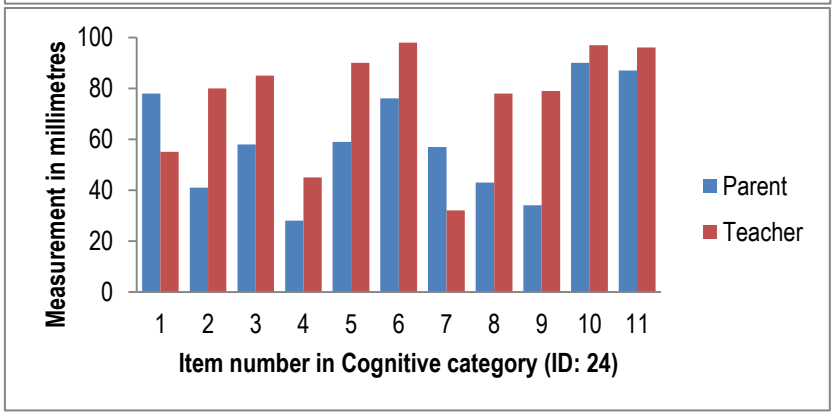

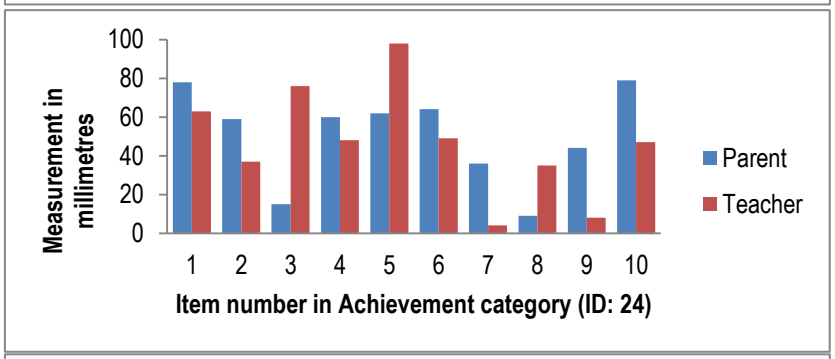

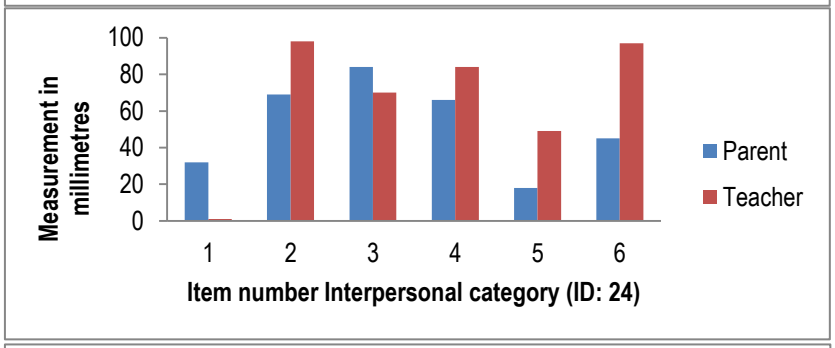

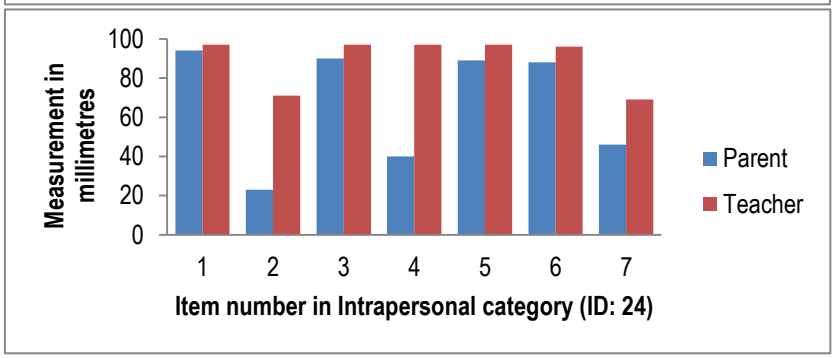

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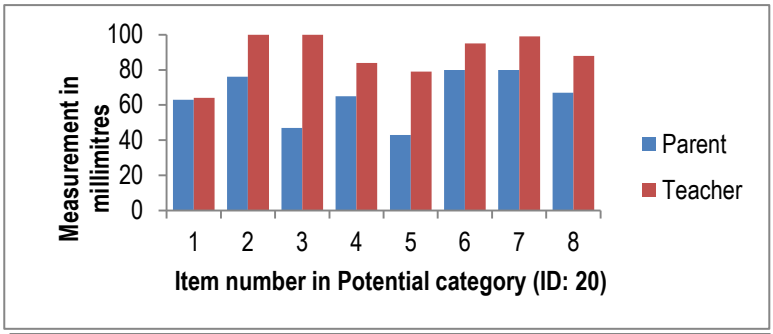

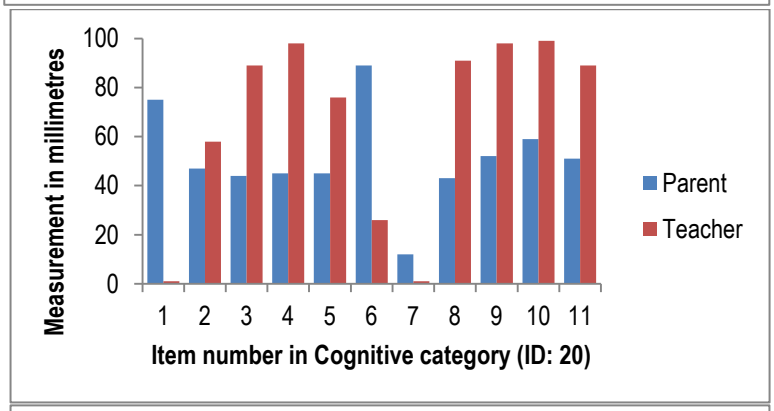

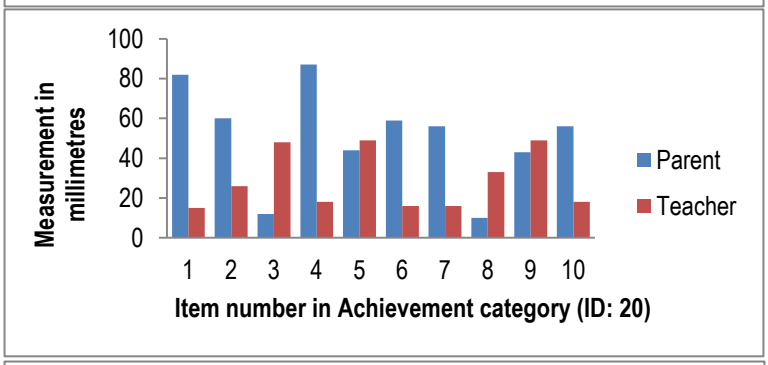

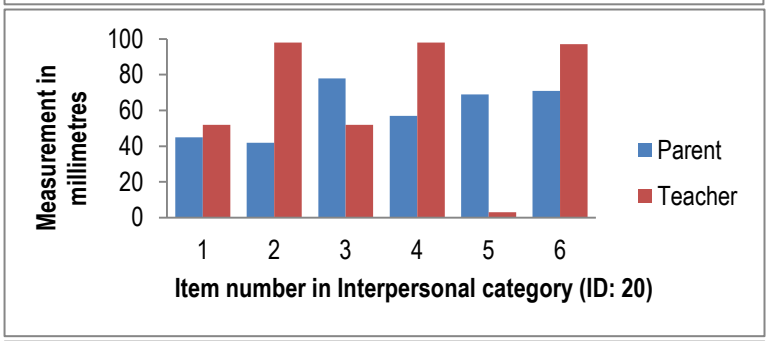

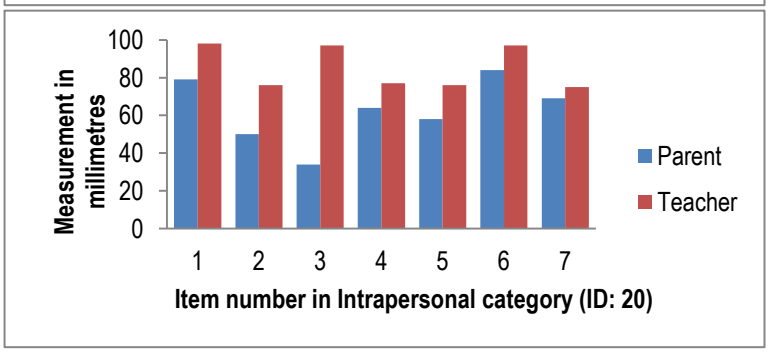

Appendix 38. Reliability and Item-total Statistics for PTQ (except job-share Teacher 2)

Potential category

Reliability Statistics

Cronbach's Alpha	N of Items
.692	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Potential - learns new concepts easily	571.33	5508.970	.339	.677
Potential - high level of talent in at least one area	549.00	5448.000	.273	.684
Potential - in-depth knowledge in high interest area	550.67	5558.788	.604	.666
Potential - strong verbal communication skills	558.50	4449.364	.742	.589
Potential - strong reasoning and problem solving	556.50	4250.455	.811	.568
Potential - asks in-depth and challenging questions	550.00	5854.182	.052	.721
Potential - highly creative	563.00	4222.545	.513	.628
Potential - enthusiasm for learning and exploring in depth	567.00	4029.455	.289	.747

Cognitive style

Reliability Statistics

Cronbach's Alpha	N of Items
.811	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Cognitive - grasps big picture rather than step by step	540.5000	32859.909	.524	.793
SequentiallearnerC2R	554.1667	36255.788	.112	.823
TakestimeC2R	560.0000	41986.909	-.423	.870
ForgetfulC2R	538.5000	26204.636	.916	.742
PlanningorganisingC2R	542.3333	26714.424	.867	.748
RememberinstructionsC2R	534.6667	29248.242	.688	.772
Cognitive - sustains attention completing a task	539.1667	26177.970	.909	.742
Cognitive - recalls verbal information easily	536.6667	33004.970	.348	.808
Cognitive - follows verbal instructions easily	534.3333	29703.515	.866	.763
Cognitive - prefers to see it to get a better understanding	526.3333	37343.879	-.013	.832
KeepingtrackC2R	541.6667	30592.606	.500	.793

Achievement

Reliability Statistics

Cronbach's Alpha	N of Items
.785	10

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ExplainsclearlyA2R	460.3333	18599.879	.112	.795
Achievement - school results can vary	431.1667	14297.970	.759	.726
Achievement - enjoys repetitive tasks	439.0000	19012.000	-.034	.813
Achievement - difficulties in handwriting and presentation	429.6667	13173.333	.851	.706
Achievement - needs to be actively engaged at school or home	414.6667	15320.242	.635	.746
Achievement - not always motivated by school work	450.0000	14073.818	.646	.738
Achievement - challenges with reading comprehension	468.3333	14104.242	.613	.743
Achievement - challenges in mathematics	456.3333	14641.697	.679	.737
Achievement - gap between verbal ability and written expression	438.0000	15832.727	.375	.779
ComputerskillsA2R	469.0000	20147.636	-.250	.828

Interpersonal category

Reliability Statistics

Cronbach's Alpha	N of Items
.343	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ReflectiontimeINTER2R	363.5000	2861.364	.469	.015
Interpersonal - 'comes to life' in the company of others	305.6667	4411.879	.484	.247
PrefersowncompanyINTER2R	336.5000	2903.909	.499	.002
Interpersonal - enjoys playing with peers	311.3333	4009.697	.500	.180
Interpersonal - shows leadership skills	331.5000	5331.909	-.258	.593
Interpersonal - capable of setting up situations or making adjustments for own advantage	342.3333	4398.424	-.080	.508

Intrapersonal category

Reliability Statistics

Cronbach's Alpha	N of Items
.818	7

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Intrapersonal - is sensitive	369.6667	12630.788	.467	.808
Intrapersonal - a perfectionist and worries about making mistakes	416.5000	10551.545	.508	.810
GivesupINTRA2R	378.3333	12473.333	.443	.811
Intrapersonal - can be self-critical	391.6667	9914.061	.714	.763
Intrapersonal - can experience anxiousness	389.0000	10522.545	.654	.776
Intrapersonal - works hard to achieve a goal	376.0000	12564.727	.405	.816
Intrapersonal - excessive demand on self through being so 'driven'	409.8333	10801.242	.775	.759