Classroom assessment adjustments, academic achievement, academic wellbeing: a mixed methods study of australian secondary school students with and without disabilities

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Classroom Assessment Adjustments, Academic Achievement, Academic Wellbeing: A Mixed Methods Study of Australian Secondary School Students with and without Disabilities

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Statement of Original Authorship

This thesis contains no material that has been extracted in whole or in part from a thesis that I have submitted towards the award of any other degree or diploma in any other tertiary institution. No other person's work has been used without due acknowledgment in the main text of the thesis. All research procedures reported in the thesis received the approval of the Australian Catholic University's Human Research Ethics committee.

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Glossary

Academic responsibility	An individual's beliefs that they, rather than others, usually cause the successes and failures they experience in intellectual achievement situations.
Academic self-concept	A student's knowledge and perceptions of themselves in educational contexts.
Access skills	Prerequisite skills students are presumed to have acquired to undertake an educational assessment.
Accommodations	The term used to describe adjustments in some countries. In Australia, the preferred term is adjustments.
Adjustments	Measures or actions taken by an education provider to alter curriculum, instruction and/or assessment to enable students with disabilities to participate in education on the same basis as students without disabilities.
Extensive adjustments	The fourth level of adjustments according to the Nationally Consistent Collection of Data (NCCD), including highly individualised curricula and assessments that are made for a student at all times to undertake school activities.

Inclusive education	A systemic change in the education process that aims to remove barriers and empower all students to participate in learning activities and the learning setting with their same-aged students.
Mainstream schools	A mainstream school is one that enrols both students with and without disabilities and provides additional assistance to students with disabilities in regular classes.
Nationally Consistent Collection of Data (NCCD)	An annual data collection that provides information about the number of students with disabilities in Australian schools and the level of adjustments they receive due to a disability or imputed disability.
Quality Differentiated Teaching Practice (QDTP)	The first level of adjustments according to the NCCD, including active monitoring and minor adjustments that teachers make occasionally within the resources of the classroom.
School Satisfaction	An individual's cognitive assessment of the quality of their school life.
Substantial adjustments	The third level of adjustments according to the NCCD, including frequent supports that a student receives at most times to undertake their educational activities.

Supplementary adjustments	The second level of adjustments according to the NCCD, including supports that a student often receives for particular activities at specific times to overcome educational barriers.
Target skills	The target constructs that are intended to be measured by an assessment.
Year level	Australian synonym of Grade level representing class cohorts as based on age-based peers, not curriculum content.

List of Abbreviations

ABS	Australian Bureau of Statistics
ACAP	Adjustments in Classroom Assessment Project
ACARA	Australian Curriculum, Assessment and Reporting Authority
ADHD	Attention Deficit Hyperactivity Disorder
AIHW	Australian Institute of Health and Welfare
AITSL	Australian Institute for Teaching and School Leadership
AERA	American Educational Research Association
APA	American Psychological Association
APD	Auditory Processing Disorder
ASD	Autism Spectrum Disorder
BFLPE	Big-Fish-Little-Pond Effect
DDA	Disability Discrimination Act
DSE	Disability Standards for Education
DSM-5	Diagnostic and Statistical Manual of Mental Disorders
EAP	Education Adjustment Program
HOSE	Head of Special Education
IAR	The Intellectual Achievement Responsibility Scale
ICSEA	Index of Community Socio-Educational Advantage
NAPLAN	National Assessment Program – Literacy and Numeracy
NCCD	Nationally Consistent Collection of Data

NCME	National Council on Measurement in Education
SCT	Social-Cognitive Theory
SDQ-II	The Self Description Questionnaire II
SLI	Specific Language Impairment
UNESCO	United Nations Educational, Scientific and Cultural Organization
UDL	Universal Design for Learning
QCAA	Queensland Curriculum and Assessment Authority
QCAR	Queensland Curriculum, Assessment and Reporting
QDTP	Quality Differentiated Teaching Practice
VCAA	Victorian Curriculum and Assessment Authority
WHO	World Health Organization

Abstract

Classroom Assessment Adjustments, Academic Achievement, Academic Wellbeing:

A Mixed Methods Study of Australian Secondary School Students

with and without Disabilities

This mixed methods study[1] examined the relationship between academic achievement and academic wellbeing for students with and without disabilities, and the effect of the provision of assessment adjustments on achievement and academic wellbeing for students with disabilities, in Australian mainstream secondary schooling.

The study is framed through the biopsychosocial model of disability and social-cognitive theory, emphasising the interactional nature of disability with personal and environmental factors. Although correlational studies examining relationships between achievement and academic wellbeing have been undertaken elsewhere, this study provides evidence about the nature of these relationships for students in Australia. Further, a qualitative study was undertaken to provide new insights into how academic achievement and wellbeing are related for students with disabilities in inclusive education settings. In these settings, adjustments to enable students to demonstrate their achievement are expected in law and policy.

[1] . This research study was an extension of the Australian Research Council Discovery Project DP150101679 *Effective Teacher-Based Assessment Adjustments for Secondary Students with Disability* (Adjustments in Classroom Assessment Project [ACAP]).

A two-strand parallel mixed methods design was used with data collected from two independent groups of participants. In Strand 1 of the study, a correlational study was conducted with 42 students with disabilities and 80 students without disabilities in classrooms in mainstream schools in Australia. Students in the middle years of schooling (Years 7-10) are particularly at risk of not completing school. The students completed the Academic Wellbeing Questionnaire comprised of three research scales: (a) the Self Description Questionnaire II (SDQ-II); (b) the Intellectual Achievement Responsibility Scale (IAR); and (c) the subscale of School Satisfaction from The Multidimensional Student's Life Satisfaction Scale (MSLSS; Huebner, 1994). Information recorded by schools for the Nationally Consistent Collection of Data (NCCD) was used to identify the level of implemented adjustments in the classroom for students with disabilities. Student achievement data in English and Mathematics based on classroom assessments were provided by schools.

Strand 2 of the study consisted of two segments, individual qualitative case studies and cross-case analysis with four case study students. These students completed structured and semi-structured surveys from the Adjustments in Classroom Assessment Project (ACAP) study as well as the Academic Wellbeing Questionnaire. Classroom assessment tasks, adjustments and student assessment responses were collected for the case study students. The first segment of Strand 2 of the study explored how teachers adjusted teacher-designed classroom assessment tasks for four case study students with regard to impairments in access skills and target skills that were assessed by a task. The tasks were summative assessment tasks intended to contribute to reporting to parents but also to have a formative assessment role to contribute to improving student learning. The perceptions of the students, parents, and teachers were explored as to how the provided adjustments related to student outcomes in

focus subject areas. The provided assessment adjustments enabled the case study students to demonstrate their knowledge, although not all students were satisfied with their outcomes. The second segment of Strand 2 of the study investigated the academic achievement of case study students in relation to their academic wellbeing under adjusted assessment conditions.

The synthesised findings of this study indicated that students with disabilities in inclusive education in mainstream schools are not necessarily low achievers but can reach a level of achievement in some or even all subject areas similar to students without disabilities. The perception of students with and without disabilities about academic abilities, especially in mathematics, was related to their achievement level. Students with and without disabilities had a similar thinking style about academic responsibility. This meant that they were more likely to take internal responsibility for academic success than failure. Findings indicated that students both with and without disabilities were predominantly satisfied with school but the level of school satisfaction of students with disabilities related to their academic achievement, especially in mathematics. The provision of classroom assessment adjustments bridged the gap between the academic achievement and academic wellbeing of students with disabilities to be comparable to their peers without disabilities, especially in mathematics.

Overall, this research sheds light on how access to classroom assessment adjustments enables students with disabilities to undertake assessment tasks on the same basis as students without disabilities, which may, in turn, improve their academic achievement outcomes and academic wellbeing.

Keywords: disabilities, classroom assessment adjustments, academic self-concept, academic responsibility, school satisfaction.

CHAPTER 1: Introduction

Once upon a time the animals decided to organise a school. They developed a curriculum that would satisfy everyone. Therefore, they chose four subjects: running, climbing, flying, and swimming. All the animals studied all the subjects. The duck was excellent in swimming, but he made only passing grades in flying and was very poor in running. The fish came home from school and said, 'Mom, Dad, I hate school. Swimming is great. Flying is fun if they let me start in the water. But running and climbing? I don't have any legs, and I can't breathe out of the water[2]*.'*

This fable mirrors the experiences of students with disabilities attending mainstream schools, where curricula have been designed to meet most students' learning needs but not all students (de Bruin, 2020). The experiences of Alfie, Liam, Daniel and Leo, the qualitative study participants in this study, reflect how educational adjustments provided in response to their disabilities relate to their academic achievement and academic wellbeing. In this study, Daniel was a small fish in a big pond. Like the fish in this fable, this left Daniel feeling bored in the classroom. Being with bigger fish in a small pond may make smaller fish like Daniel form negative beliefs about their academic abilities and school experiences (Arciuli et al., 2019; Dixon et al., 2008). Although educational adjustments were in place for Daniel, they often were either inappropriate or insufficient, indicating that there are still barriers to accessing education for Australian students with disabilities in mainstream schools.

This study is situated within the context of inclusive education, that is, 'all children should learn together, wherever possible, regardless of any difficulties or differences they

[2] . This is an adaptation of the fable, 'The Animal School', by George Reavis (1940).

may have', as declared in the Salamanca Statement (United Nations Educational, Scientific and Cultural Organization [UNESCO], 1994, p.7). This Statement has been described as 'the most significant international document that has ever appeared in the field of special education' (Ainscow & César 2006, p. 231). The Salamanca Statement has undoubtedly resulted in positive changes in some areas. Students with disabilities who were once considered not educatable are now included in schools (Boroson, 2017), and discourse on equity has become an important component in the educational debate (Rasooli et al., 2021).

Australia as one of the first nations that signed the Salamanca Statement has adopted inclusive education as an underlying basis for all students' education (Anderson & Boyle, 2019). In Australia, two overarching goals have been declared for schooling based on the Mparntwe Education Declaration: 'The Australian education system promotes excellence and equity'; and, 'All young Australians become confident and creative individuals, successful lifelong learners, and active and informed members of the community' (Education Council, 2019b, p. 4). These goals identify commitment to 'access to high-quality education that is inclusive and free from any form of discrimination' (p. 5) for all students, including students with disabilities. As a result of these and related policy directions, approximately 90% of students with disabilities in Australia are being educated in mainstream schools (Australian Institute of Health and Welfare [AIHW], 2020).

Principles of equity in education for students with disabilities have been ratified in law through the Disability Standards for Education (DSE, 2005), whereby Australian students with disabilities should be able to access and participate in all educational activities 'on the same basis' as students without disabilities. The term 'on the same basis' indicates that students with disabilities should access the same quality of education that is offered to students without disabilities (DSE, Standard 4.2). Accordingly, education providers are obligated to provide reasonable adjustments to ensure effective education for students with disabilities (DSE, 2005; UNESCO, 1994). Approximately 20% of Australian students have been reported to have a disability (Australian Curriculum, Assessment and Reporting Authority [ACARA], 2020), with about 19% of students receiving some form of adjustment due to disability to enable them to make progress in the general education curriculum (Education Services Australia, 2020a). However, 10% of the Australian students identified as having disabilities have reported that they do not receive support even though they require it, and 21% of students have reported that they need more help than they currently receive (AIHW, 2020).

1.1. Problem Statement

The overall purpose of this study was to investigate the relationship between academic achievement and academic wellbeing of secondary school students with disabilities compared with those without disabilities and, further, to explore how adjustments in classroom assessment improve the achievement and academic wellbeing of students with disabilities. In Australia, education goals are that all students should be confident and successful learners and be ‘supported to achieve their full educational potential’ (Education Council, 2019b, p. 5). A healthy sense of self is not only a desirable educational goal itself (Education Council, 2019a) but also promotes other educational goals such as academic achievement (Susperreguy et al., 2018). ‘Self’ is regarded as a set of beliefs about oneself in relation to academic abilities and tasks. Internationally, a body of literature indicates the effects of students’ beliefs on learning and cognitive functioning. Among these beliefs, *academic self-concept* and *academic* *responsibility* have been found to have motivational effects on students' academic achievement (Kavanagh, 2020; Park et al., 2020).

Academic self-concept is described as a student's perception of their educational capabilities (Shavelson et al., 1976). Research has provided some evidence that academic achievement is associated reciprocally with academic self-concept (Grygiel et al., 2016; Wolff et al., 2020). More importantly, it has been evidenced that academic achievement in a specific subject area is related to academic self-concept in that subject area (Fu et al., 2020; Susperreguy et al., 2018). Students with a high level of academic self-concept see themselves as valuable and competent and, therefore, are more motivated to perform well at school (Bandura, 2001; Wei & Marder, 2012). They have a higher opportunity for university entry (Parker et al., 2012) and are more satisfied with their life (Chui & Wong, 2016).

Most previous research studies have compared general academic self-concept between students with and without disabilities. Little is known about how academic achievement in a specific domain relates to self-concept for students with disabilities (McCauley et al., 2018). Thus, this research study took a domain-specific approach to examine the relationship between academic achievement and academic self-concept and whether students with disabilities perceived their academic abilities differently from students without disabilities.

Academic responsibility is generally defined as the degree to which students perceive that they are able to control factors (e.g., effort, academic skills) that may influence their academic achievement (Hasan & Khalid, 2014; Park et al., 2020), that is, how students view the causes of their success or failure at school (Hadsell, 2010). Generally, academic responsibility can either be internal or external, for example, whether academic success results from a student's capabilities and hard work (internal causes) or outside factors such as chance or luck (external causes). Students with an internal orientation are more likely to obtain high achievement outcomes (Shepherd et al., 2006) and positively perceive their academic abilities (Albert & Dahling, 2016; Lohbeck, et al., 2017). Therefore, it is crucial for students, especially students with disabilities, to understand that their expectations of academic success can be improved with more effort and persistence (Park et al., 2020). These beliefs motivate students to learn skills they do not yet have and help them achieve more academic success (Bandura et al., 2003).

Successful academic outcomes are most often viewed in terms of achievement (Jiang et al., 2013). However, non-academic outcomes such as school satisfaction have received less attention (Suldo et al., 2014). *School satisfaction* refers to how students feel about school and how they evaluate their school experiences (Huebner, 1994). Among five domains of life satisfaction (self, family, friends, living environment, and school), adolescents have reported the most dissatisfaction with their school experiences (Long et al., 2012; Whitley et al., 2012). School satisfaction was found to be an important outcome of academic achievement (Hui & Sun, 2010; Tian et al. 2016). Thus, another fundamental aim of schools is to help students develop a strong sense of school satisfaction alongside the acquisition of knowledge and other skills (Jiang et al., 2013).

Many studies have shown that the level of life satisfaction of students with disabilities is not significantly different from that of students without disabilities; however, the findings are mixed in the component of school satisfaction (Arciuli & Emerson, 2020; Awasthi et al., 2016; Gallagher et al., 2020). This research study sought to determine whether students' academic achievement relates to the level of their satisfaction with school and whether students with disabilities evaluate their school experiences differently from students without disabilities.

In this study, *Social-Cognitive Theory* (SCT; Bandura 1982) was applied to interpret how students perceive their academic abilities and experiences in relation to academic achievement within the educational setting. According to this theory, human learning is the result of reciprocal interactions among personal factors (e.g., beliefs, skills, motivation, social comparisons), one's behaviour (e.g., effort), and environmental factors (Bandura, 2001). In this dynamic conceptualisation, academic achievement is a behavioural factor that affects academic self-concept, academic responsibility and school satisfaction (personal factors) and environmental factors (e.g., instruction, educational adjustments) and in turn is affected by these. Additionally, from these interactions, one's belief about one's academic abilities and control of events are formed. Students who perceive their own capabilities positively consider their own behaviours as valuable and are more likely to be motivated to reach academic success. Thus, student behaviours (e.g., effort, persistence) result from their own choices within the environment. These conceptualisations (self-concept, academic responsibility, school satisfaction) are closely tied with social-cognitive theory.

The *Big-Fish-Little-Pond Effect Model* (BFLPE; Marsh, 1984) is also used to explicate how students compare their academic capabilities with those of their peers and how this social comparison affects their academic self-concept. Social comparison is considered a personal factor in social-cognitive theory. To date, no research has been found to-use the BFLPE Model for Australian students with disabilities in mainstream classrooms. This study provided examples for this Model using the actual experiences of case study students with disabilities, which is discussed in Chapter 7.

In this study, consistent with the social-cognitive approach, a *biopsychosocial model* of disability (Engel, 1977) was used to explore how eliminating or reducing barriers relating to effects of student disabilities, socioemotional factors, and medical conditions enables students with disabilities to demonstrate what they know and what they can do. This model provides an appropriate framework for considering effective assessment adjustments for students with disabilities. In the biopsychosocial model, disability is considered as an activity restriction created through the interactions between health conditions, student disabilities, student-related psychosocial factors and educational barriers (Graham, 2020), which affect student academic achievement and academic wellbeing.

Given international evidence on *the relationship between academic achievement and academic wellbeing* for students with and without disabilities, this study further investigates how enactment of inclusive education and principles of adjustments enable students with disabilities to participate in education and demonstrate their knowledge and skills through assessment. It is hypothesised that improving achievement outcomes for students with disabilities may improve their academic wellbeing. This study reports assessment task adjustments provided for four case study students in Chapters 5 and 6 and how these related to the students' achievement and wellbeing.

School-aged students are expected to have multiple skills and knowledge to undertake daily classroom activities and assessment tasks. Some skills are the core focus of the learning and assessment tasks; however, some are not. *Access skills* are those prerequisite skills that students need to carry out assessment tasks but are not intended to be measured by the assessment (Kettler & Elliott, 2010). Target knowledge and skills are the target constructs that are intended to be measured by the assessment (Dembitzer & Kettler, 2018). Whether students with disabilities can do tasks can depend on whether they have the necessary access skills. Impairment in access skills is one of the challenges students with disabilities often face in both learning new knowledge and skills and undertaking assessment tasks to reveal their knowledge and skills. When students do not have well-developed access skills to perform an assessment task, their outcomes may not be reflective of what they can do (Kettler & Elliot, 2010). However, the nature of student disabilities is not highly predictive of adjustments that students need (Kettler, 2015), that is, different students may have different access skills. Therefore, awareness of student's access skills and potential impairments in these specific assessment tasks, is of considerable importance.

Differences in access skills can be taken into account by *educational adjustments*, described as 'measure[s] or action[s] taken by an education provider to enable learners with disability to participate in education and training on the same basis as learners without disability' (Department of Employment, Small Business and Training, 2018, p. 5). Accordingly, appropriate adjustments to reduce or remove barriers related to access skills need to be identified (Davies et al., 2016; Mathes et al., 2020). Over the past three decades, instructional and assessment adjustments have been provided at increasing rates in elementary and secondary settings (Randall & Engelhard, 2010). Here, the focus will be on assessment tasks, since they are the basis for discovering whether students are learning.

Previous research has demonstrated conflicting findings as to whether assessment adjustments effectively improve academic achievement (Buzick & Stone, 2014; Spiel et al., 2016). Most of these research studies have been performed with standardised tests among students with and without disabilities within experimental or quasi-experimental settings. Limited research has been conducted to consider the effectiveness of assessment adjustments on academic achievement of students with disabilities in non-experimental settings (Taylor, 2017). Moreover, previous studies regarding assessment adjustments have not specifically looked at how the provision of assessment adjustments contribute to the improvement of achievement outcomes for students with disabilities. Therefore, in order to contribute to and fill such gaps in the body of research, this study looked at how assessment tasks were adjusted, and then explored how academic achievement of students with disabilities in a specific subject area related to the implemented adjustments. In this research study, adjustments provided were addressed through consideration of target skills in focus subject areas and the functional impairments that students with disabilities had in access skills.

Overall, to date, research on academic wellbeing components (academic self-concept, academic responsibility, school satisfaction), academic achievement and assessment adjustments has predominantly been carried out through quantitative methods emanating from the US and countries other than Australia. As described previously, the research findings are mixed as to how students with disabilities perceive their academic capabilities, schooling experiences and reasons for their academic success and failure, and whether the provision of assessment adjustments has been effective for students with disabilities to undertake their tasks.

1.2. Purpose of Study and Research Questions

Qualitative and quantitative approaches together may lead to a more meaningful understanding of the phenomenon under investigation than would be possible using only one of these methodologies (Creswell & Guetterman, 2021). Hence, more methodologically diverse research is needed to construct sophisticated understanding of academic achievement, academic wellbeing, and classroom assessment adjustments in mainstream schools. In Strand 1 of the study, a quantitative study, the research aim was to examine relationships and discrepancies between academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) for secondary school students with and without disabilities in mainstream schools. Thus, the following three research questions were used to guide the quantitative study:

Research Question 1: What is the relationship between academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) for Australian secondary students with and without disabilities?

Research Question 2: Are there differences in academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) between secondary students with and without disabilities?

Research Question 3: Are there differences in academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) across the Nationally Consistent Collection of Data (NCCD)[3] levels of implemented adjustments for secondary students with disabilities?

Since students with disabilities are generally the population of students to receive assessment adjustments, Strand 2 of the study, a qualitative study, was designed to give them a voice about their assessment experience within the classroom. Thus, the purpose of this strand of the study was to gain an understanding of the relationship between academic

[3] . Nationally Consistent Collection of Data (NCCD): discussed in Chapter 2.

achievement and classroom assessment adjustments for case study students with disabilities. Furthermore, another aim of this strand of the study was to explore how academic achievement of students with disabilities under adjusted situations related to their academic wellbeing. As such, the following research questions were addressed:

> *Research Question 4:* How does academic achievement relate to selected adjustments to classroom assessment for secondary students with disabilities?

> *Research Question 5:* How does academic achievement under adjusted conditions relate to academic wellbeing (academic self-concept, academic responsibility, school satisfaction) of secondary students with disabilities?

1.3. Significance of the Study

Education is connected to a broad range of social and economic gains for society and provides better career outcomes and better quality of life for individuals. Therefore, the drive to bridge the gaps in learning has led to many attempts to identify and implement efficient solutions for enhancing outcomes for the disadvantaged (Centre for International Research on Education Systems, 2020). The number of students with disabilities who are receiving educational adjustments in mainstream schools has increased (Education Council, 2019a). In Australia, it is unlawful to treat students unfairly due to a disability (Disability Discrimination Act (Cth), 1992). Therefore, provision of suitable adjustments can result in educational fairness in assessment (Sireci et al., 2005).

It is reported that students with disabilities are less likely to complete Year 12 than students without disabilities (AIHW, 2017; Wexler & Pyle, 2012), with subsequent impact on further educational and employment opportunities (Cumming et al., 2013). Thus, understanding how to support students with disabilities is necessary to provide successful educational experiences and help the transition of this student group into society as contributing members, as expected through Australian education goals.

As noted, conflicting findings have been reported about the effectiveness of assessment adjustments on academic achievement for students with disabilities, including experimental studies comparing these students with students without disabilities (Giusto & Ehri, 2018; Lovett & Lewandowski, 2015). This indicates a need for additional research, specifically addressing the experiences of students with disabilities, the adjustments provided, and the effects on outcomes using a qualitative approach. Furthermore, this research study suggests that stakeholders may need to consider why some students cannot adequately demonstrate their potential despite the adjustments made. This is the first Australian study investigating how academic achievement in specific subject areas relates to classroom assessment adjustments from the perspectives of key stakeholders, students, parents, and teachers.

When making decisions about adjustments, it is beneficial that we understand how students' academic achievement relates to their academic wellbeing. This study adds to the research regarding these relationships. Compared with the large number of studies regarding the relationship between academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) for students without disabilities, relatively little research has been conducted in this area involving students with disabilities. Accordingly, the current study examined the relationship between academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) for students with disabilities and compared this relationship with those of students without disabilities.

These relationships were examined with participants in Years 7 to 9, approximately 12 to 15 years old, with and without disabilities. This particular cohort was chosen for two reasons. First, the self is a cognitive construct (Harter, 1999) that becomes increasingly differentiated during adolescence. Thus, secondary school students are better able to appraise their academic abilities and school experiences. Second, based on prior research, it is known that academic self-concept drops to its lowest level during middle adolescence (Marsh & Ayotte, 2003), and that the level of school satisfaction also decreases (Elmore & Huebner, 2010; Okun et al., 1990; Uusitalo-Malmivaara, 2014). Given middle-school students are at most risk in education and wellbeing (Elmore & Huebner, 2010; Wyatt-Smith et al., 2017), this period is a critical context to scrutinise.

1.4. Definition of the Terms

Disability is defined generally as past, existing and future disabilities relating to mental functions, disease or illness, body malformation, learning disorders, and emotional disorders (Disability Discrimination Act (Cth) [DDA], 1992).

Inclusive education is a systemic change in the education process that aims to remove barriers and empower all students to participate in learning activities and the learning setting with their same-aged students (Graham, 2020)

Mainstream schools are educational settings that are created for most students, including students with disabilities, but not all students (de Bruin, 2020).

Adjustments are measures or actions taken by an education provider to enable students with disabilities to access and participate in education on the same basis as learners without disabilities (Swancutt et al., 2020).

Classroom assessment is an important tool to identify specific learning needs, change teaching and learning practices, provide feedback to students and parents, and report students' achievement outcomes (Wyatt-Smith et al., 2017).

Access skills are the prerequisite skills students are presumed to have acquired to undertake an educational assessment (Dembitzer & Kettler, 2018).

Target skills are the target constructs that are intended to be measured by the assessment (Dembitzer & Kettler, 2018).

Academic self-concept refers to students' knowledge and perceptions of themselves in educational contexts (Möller et al., 2009).

Academic responsibility is defined as an individual's beliefs that they, rather than others, usually cause the successes and failures they experience in intellectual achievement situations (Crandall et al., 1965).

School satisfaction is defined as the 'subjective, cognitive appraisal of the perceived quality of school life' (Baker & Maupin, 2009, p. 189).

1.5. Outline of the Remaining Thesis Chapters

This thesis is structured in seven chapters. Chapter 1 has described the problem statement, details of research purpose and the research questions, significance of the current research, and outlined the theoretical framework underpinning the research. Chapter 2 outlines a review of the related research literature on inclusive education policy and law in Australia, and assessment adjustments and academic wellbeing components, including academic self-concept, academic responsibility, and school satisfaction, in relation to academic achievement of students with and without disabilities. Chapter 3 explicates the research methodology used in this study, including the research design, participants, data collection procedures, and measures. Chapter 4 addresses Research Questions 1 through 3 and represents the quantitative findings. Chapters 5 presents the qualitative findings relating to Research Question 4. Chapter 6 delves into Research Question 5 and describes the findings relating to cross-case analysis. Chapter 7 presents a discussion of the research findings and discusses how these findings contribute to existing knowledge about this research problem and synthesises the results of both quantitative and qualitative findings in terms of the study research questions. The thesis concludes with Chapter 8, which summarises the study's main findings, describes the limitations and, finally, considers implications for inclusive education assessment theory, policy and practice and recommendations for future research.

CHAPTER 2: Literature Review

'*If a child can't learn the way we teach, maybe we should teach the way they learn*'

Ignacio Estrada

2.0. Introduction

The aims of this research study were twofold: (i) to examine the relationship between academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) for Australian secondary school students with and without disabilities; (ii) to investigate how academic achievement related to provision of classroom assessment adjustments, as required by Australian legislation, and academic wellbeing of Australian students with disabilities. The first aim of the study extends international and Australian research on student achievement and academic wellbeing and provides new evidence of their relationship for Australian students with disabilities. The second aim, reflecting an overall purpose of this research, is to examine more deeply these relationships in the Australian context for students with disabilities in inclusive education settings. A range of policy and legislative requirements indicate that adjustments in assessment should be undertaken to address assessment design barriers and to assist these students to perform at an optimal level.

The following literature review is organised into five sections. First, as the focus of the study is directed towards classroom assessment adjustments for students with disabilities, conceptualisations of disability, classroom assessment and adjustments are described. Additionally, literature regarding the effects of assessment adjustments on academic achievement for students with disabilities are reviewed. Conceptualisation of academic self-concept and the relationship between academic achievement and academic self-concept for both students with and without disabilities are discussed in the second section. The third section of the literature review brings together and examines research on academic responsibility and its associations on academic achievement for students with and without disabilities. In the fourth section, the literature on school satisfaction of students with and without disabilities in relation to academic achievement is provided. Finally, the chapter summary is presented in the fifth section.

2.1. Students with Disabilities, Schooling, Assessment Adjustments and Achievement

In Australia, inclusive education prevails in schools. In inclusive education, all students have an equal educational right to participate in learning experiences and the learning settings alongside their same-age peers (Disability Standards for Education [DSE], 2005). It has been estimated that approximately 20% of Australian students have a disability (Education Services Australia, 2020a); 89% of these students attend mainstream schools, with a minority attending special schools (O'Donnell et al., 2016). All students with disabilities should be able to equitably access the curriculum and participate in all educational activities 'on the same basis' as students without disabilities (DSE, 2005).

Under the Disability Discrimination Act (Cth) (DDA, 1992), it is unlawful to treat students unfairly due to a disability in Australia. Yet students with disabilities sometimes face educational discrimination in school. This discrimination may occur in different aspects of schooling, from the time of enrolment, to participation in curricular activities that might exclude a student with disabilities in some way (DDA, 1992). The DSE (2005) address discrimination in all aspects of education provision. Discrimination can occur directly or indirectly. For example, not being accepted for enrolment at a school because of a disability is an example of direct educational discrimination (DDA, 1992). Indirect discrimination occurs when a student with disabilities is required to perform an activity which is unreasonable or unachievable for him or her (Cumming et al., 2013), for instance, when a student with vision impairment is required to but cannot read written material because of a lack of reasonable adjustment to accommodate their condition (DDA, 1992). In the following section, the Australian definition of disability and models of disability are discussed.

2.1.1. Conceptualisations of Disability

Different definitions of disability are often based on separate or overlapping legal, social, and political factors (Smeltzer, 2007). 'The disability is not the single defining characteristic of the individual; rather the disability is one of several important parts of the individual's self-identity' (Smart & Smart, 2006, p. 29). Under the DDA (1992), in Australia, a disability is defined legally as:

- total or partial loss of the person's bodily or mental functions; or
- total or partial loss of a part of the body; or
- the presence in the body of organisms causing disease or illness; or
- the presence in the body of organisms capable of causing disease or illness; or
- the malfunction, malformation or disfigurement of a part of the person's body; or
- a disorder or malfunction that results in the person learning differently from a person without the disorder or malfunction; or

- a disorder, illness or disease that affects a person's thought processes, perception of reality, emotions or judgment or that results in disturbed behaviour (DDA, 1992 § 4.1).

Both past and existing, as well as possible future, physical, intellectual, psychiatric, sensory, neurological and learning disabilities are also included in this definition (DDA, 1992). The DDA definition of disability encompasses general categories of disability. This definition applies to provisions under the DSE (2005) and is therefore relevant to identification of students with disabilities in Australian schools. Use of 'certain words, terms and categories' (Graham & Macartney, 2012, p. 190) is a starting point to design curriculum, pedagogical and assessment practices to enable students with disabilities to access and engage in education. However, research on disabilities goes beyond the use of classifications. In order to obtain a better understanding of disability, models of disability are discussed below.

2.1.2. Models of Disability

Models of disability provide a context for consideration and analysis of disability by which disability can be understood (Haegele & Hodge, 2016). There are three overarching models of disability discussed in the literature of disability studies, the *medical* model, the *social* model (Smeltzer, 2007), and the *biopsychosocial* model (Engel, 1977). A differing view on the cause of disability is the main difference between the medical and social models (Haegele & Hodge, 2016).

In the medical or individual model, the focus is on a person's disabilities, seen as directly caused by an illness or other health condition, such that medical care is needed in the form of individual treatment (Smeltzer, 2007; World Health Organization, 2002). This model has been criticised because of its focus on individual impairments and ignoring the capacity of people with disabilities to have an independent and successful life (Graham, 2020).

By contrast, the social or barrier model views having a disability as a problem created by conditions of one's social environment. The social (exclusion) model holds that a disability does not itself create a limitation as such, but rather that limitations in the environment and lack of resources create disabilities for some individuals (World Health Organization, 2002). This model is focused on removing barriers in the environment that might affect an individual and preclude their full and active participation in society (Shakespeare, 2006; World Health Organization, 2002). The social model of disability provides a framework for the development of equal opportunities in inclusive education through the provision of practical interventions for students with disabilities. However, the social model has also been criticised as it may dismiss the impacts of disease or impairments upon the life of individuals with disabilities (Shakespeare, 2006).

The third model of disability is the biopsychosocial model (Engel, 1977), which integrates both the social and medical models of disability (WHO, 2002). Within this model, the term disability is considered an activity restriction caused by the interactions between student disabilities, health conditions, student psychosocial factors and environmental barriers. According to this model, it is important to understand not only the effects of disabilities on students' learning processes and participation, but also how psychosocial characteristics and medical conditions restrict their participation in educational activities. The important implication of the biopsychosocial approach for education is that better understanding of the biological and psychological correlates of disability enables educators to provide educational settings that avoid intensifying difficulties that students may experience and that facilitate their optimal educational participation (Cooper, 2008). From the biopsychosocial perspective, student wellbeing is the result of dynamic interaction between biological, psychological, and social factors (Hollenweger, 2014). In this research study, the biopsychosocial approach was adopted to explain how the provision of adjustments, through reducing or removing barriers, assists students with disabilities to undertake assessment tasks that may affect their academic achievement and academic wellbeing within inclusive settings.

2.1.3. Classroom Assessment Adjustments

2.1.3.1. Conceptualisation of Assessment

Assessment is integral to learning and teaching and a constant component in education worldwide. It is defined generally as the collection and analysis of empirical data on student learning implemented for a range of educational purposes (McMillan, 2014). Evidence can be collected both formally through assessment tasks or informally through ongoing teacher and student observation. According to Rose et al. (2018), ‘assessment is a means of discovery about learners and their interaction with learning environments and about how learners are progressing toward standards and goals within those environments’ (p.168). The basic assessment purposes are identifying student strengths and challenges that they face and addressing the challenges before they become failures (Rose et al., 2018).

Three overarching purposes of assessment have been identified in recent research literature and policy: assessment *for*, assessment *as* and assessment *of* learning (Education Council, 2019a). Assessment for learning (or formative assessment) is defined as ‘part of everyday practice by students, teachers and peers that seeks, reflects upon and responds to information from dialogue, demonstration and observation in ways that enhance ongoing learning' (Klenowski, 2009, p. 264). Research evidence has shown that strategies that teachers effectively implement for formative assessment can enhance student achievement and motivation in the classroom as well as in large-scale tests (Chappuis et al., 2012). Moreover, a major function of assessment for learning is to offer ongoing feedback to the student about their classroom work to assist them to identify their strengths and areas for improvement during their academic studies (Black & Wiliam, 2018). However, research has identified that teachers' feedback and grades may have negative effects on students' beliefs, especially students with low achievement; so that they think that they have low ability to learn (Black et al., 2004).

Assessment as learning emphasises the recognised importance of assessment as directing (or even driving) learning and extends the role of formative assessment for learning 'by emphasizing the role of the student, not only as contributor to the assessment and learning process, but also as the critical connector, between them' (Earl, 2003, p. 25). Students as active assessors are at the centre of learning and use strategies to improve their learning process at a metacognitive level (Earl, 2013).

Assessment of learning (or summative assessment) occurs when students' learning is being evaluated, most often using various formats such as performance tasks, projects, the construction of artefacts, tests or examinations (Wyatt-Smith et al., 2017). Assessment of learning is typically administered at the end of or at a key stage of learning (e.g., a course or unit of work) and is a point in time judgement of students' performance. A point in time judgement can be determined on the basis of a single piece of assessment or combination or portfolio of evidence. Summative assessments can be used to make comparative judgements of student performance against others (Earl, 2013) or judgements against achievement standards. Summative achievement is usually reported to parents and students in the form of marks or ratings (numeric scores or letter grades) to show students' achievement at a terminal point (Department of Education (Queensland), 2020a).

Classroom assessment is also a tool through which student motivation can be increased. Brookhart (2013) stated that the amount of effort students expend in learning is related to their constructions of the nature of instructional and assessment tasks, teachers' feedback, and their self-concept about accomplishing tasks. She also claimed that students who perceive that their performance on school tasks was not accurately evaluated, were less likely to consider themselves important and increase effort.

In Australia, until the certification years at the end of secondary schooling, school assessment is mainly undertaken and developed by teachers based on a national curriculum administered across the Foundation Year to Year 10 (Cumming, 2010). The Australian Curriculum, Assessment and Reporting Authority (ACARA) provides the curriculum (https://www.australiancurriculum.edu.au). Information is also provided with the curriculum that addresses student diversity to support all students, including students with disabilities, to achieve their full potential (ACARA, n.d.). Descriptive achievement standards are one of the fundamental elements of the Australian Curriculum. Achievement standards for each learning area describe what students are expected to understand, and what students are expected to do, based on the curriculum taught at a particular Year level. The achievement standard also allows teachers to monitor student learning and judge student progress. The student achievement outcomes show whether a student has met the expected standards, or achieved above or below the standard. Each Australian state or territory is responsible for implementation of the national curriculum and assessment of student learning.

As assessment is an important component of education, guidelines exist about the nature of quality assessment practice. Most importantly, any educational assessment needs to be fit for purpose; evidence obtained about student learning should be valid, that is, suitable for interpretation of outcomes (American Educational Research Association, American Psychological Association, National Council on Measurement in Education [AERA, APA, NCME], 2014). While the predominant guidelines on quality standards for assessment have been developed in the USA for more standardised test contexts (AERA, APA, NCME, 2014), they also have relevance to classroom assessments developed by teachers. Valid interpretation of outcomes relates not only to the match between the intended learning focus and the assessment but also to awareness of factors, such as disabilities of students, that may impact on a student outcome, if no adjustment to an assessment is available. The evidence obtained should be sufficient for the interpretation to be made (AERA, APA, NCME, 2014).

In classroom assessments and, more generally, assessments where qualitative judgements are made by teachers on the basis of a range of assessment formats, consistency of judgement across contexts, that is, reliability, is also important. In Australia schools, such consistency is often obtained by common assessments across different classrooms at the same Year level in a school and by collaboration of teachers examining samples of student assessment and discussing the level of evidence of performance presented (Maxwell, 2010).

2.1.3.2. Validity of Assessment for Students with Disabilities: Target and Access Skills

Multiple skills and knowledge are required to undertake assessment tasks successfully. Some skills and knowledge are the main objects or learning focus of the task, however, some are not. Researchers examining fair and valid assessment of students with disabilities have differentiated these skills as *access* and *target* skills (Dembitzer & Kettler, 2018). *Access* skills are prerequisite skills that students need to undertake a specific assessment task. These skills are not intended to be the learning focus of the assessment but are necessary for students to demonstrate the target skills and knowledge that the task is designed to assess (Frey & Gillispie, 2018). *Target* skills are the main constructs or knowledge that are the intended focus of the assessment. For example, reading ability, attention, and working memory may be important access skills to do calculation (a target skill) in mathematics (Dembitzer & Kettler, 2018). Cumming and Maxwell (1999) further identified aspects of assessment task formats that may impact on student performance as second-order components of the task or access skills, where first-order expectations relate to the intended target skills.

Tomlinson and Moon (2013) echo the AERA, APA and NCME (2014) principles of quality for valid summative differentiated assessments for students with disabilities and the need for confidence that ‘an assessment actually measures what it is intended to measure’ (p. 9). They describe five indicators of quality in summative assessments: (1) ‘the assessment mirrors the learning goals’; (2) ‘the content of the assessment reflects the relative importance of each learning goal’; (3) ‘the format of the assessment is aligned with the cognitive level of the learning goals’; (4) ‘the range of knowledge indicated by the learning goals is the range of knowledge reflected in instruction, which, in turn, is the range of knowledge needed to appropriately respond to assessment items’; and (5) ‘an assessment should not require students to have specialized knowledge, understanding, skill, or resources beyond what is targeted by the learning goals and is taught or available in class’ (Tomlinson & Moon, 2013, pp. 93-97).

Although a task can be designed for maximal accessibility, impairments in access skills of students with disabilities pose barriers to assessment of target skills (Dembitzer & Kettler, 2018). When students do not have well-developed access skills, their assessment outcomes may reflect their limitations in that area, rather than the target skills being measured. In other words, barriers resulting from access skills lead to an invalid result (AERA, APA, NCME, 2014; Kettler & Elliott, 2010).

Construct-irrelevant variance is one of the main threats to the validity of assessment of the target construct, occurring when extraneous aspects of the assessment that are not intended to be assessed influence students' scores (Messick, 1995). In the disability context, this means that the effects of student disabilities in relation to access skills are intertwined with target skills being measured (Dembitzer & Kettler, 2018). Provision of adjustments for students with disabilities, therefore, is intended to minimise the impacts of barriers due to functional impairments in access skills and to enable them to demonstrate their target skills and knowledge during learning and assessment conditions (Kettler, 2012). There is a need, therefore, to consider the extent to which design and/or adjustments to assessment tasks have been undertaken to suit the needs of students with disability.

2.1.3.3. Conceptualisation of Adjustments

Different terms are used to describe changes made to assessment, including modification, accommodation and adjustment, albeit these terms' meanings are technically different (Davies et al., 2016). A modification is a change to an assessment or a test that may alter the test content or the level of complexity of the construct (knowledge/skills) being measured (Dembitzer & Kettler, 2018). Accommodations or adjustments are changes or supports that are provided for students with disabilities to enable them to engage in age-appropriate learning experiences and demonstrate what they have learnt (McGahee et al., 2021). Regardless of terminology, adjustments make educational activities flexible and accessible to meet students' learning needs. The term accommodation has been commonly used in research studies in some countries, especially in the US context. In Australia, the preferred term is *adjustments* which is used to describe both accommodations and modifications to formative and summative assessments and large-scale external standardised tests (ACARA, n.d.; DSE, 2005).

The provision of adjustments is aligned to Universal Design for Learning (de Bruin et al., 2020). According to the universal approach, education should be accessible for all students through planning and designing curriculum, pedagogy, and assessment (Tomlinson, 2017). In this approach, 'education needs to be adjusted to fit to the students rather than students needing to adapt themselves to fit to an education system or experience' (Cologon & Lassig, 2020, p. 182). An important principle in the UDL guidelines for Action and Expression in relation to assessment is to provide 'flexible options for ways in which learners can express their skills, knowledge, and understanding', which 'results in more accurate assessment results' (Rose et al., 2018, p. 168).

In Australia, teachers are responsible for the design of differentiated curriculum, within the framework of the Australian Curriculum and state guidelines, so that students with disabilities succeed in their learning (Australian Institute for Teaching and School Leadership [AITSL], 2017). Schools are required to make reasonable adjustments to enable students with disabilities to participate in education on the same basis as peers without disabilities. However, as stated in the 2015 Review of the DSE (Urbis, 2015), the concept of reasonable adjustments has not been clearly defined in the Standards, which results in the inconsistent provision of adjustments for students with disabilities across education departments in Australia. The recent Review of the DSE (Australian Government, Department of Education, Skills and Employment, 2020) also recommended the need to 'explore strategies to improve continuity and consistency of adjustments between classroom and assessment contexts (p. 71)

In an endeavour to address such inconsistency, the Nationally Consistent Collection of Data (NCCD) is being undertaken across all Australian schools. The NCCD is an annual data collection that provides information about the number of students with disabilities in schools and the level of adjustments they receive due to a disability. Overall, the purpose of the NCCD is to provide information on active support of students with disabilities undertaken by schools to enable the students to participate in classroom activities and assessment on the same basis as other students (Education Services Australia, 2020a). Students with disabilities are included in the national data collection if they are identified by teachers/school teams based on the DDA's definition of disability and obligations under the DSE (2005) as well as other evidence such as medical reports, individual learning plans and assessment, and discussions with parents/carers. Schools and teachers' professional judgments determine the level of adjustments being made individually for students with disabilities. Depending on the extent of the effects of disability in relation to education, students may require adjustments in one or more areas, including planning, teaching and learning, curriculum, assessment, reporting, and environment and infrastructure (Education Services Australia, 2020a).

In the NCCD, the level of adjustments is identified as one of four categories including: *extensive* adjustments, *substantial* adjustments, *supplementary* adjustments, and *support provided within quality differentiated teaching practices* (QDTP). Students who need the extensive level of adjustments are provided with highly individualised curricula, activities and assessments at all times. At the substantial level, students with disabilities require frequent supports at most times to undertake their educational activities. Typically, students require curriculum modified which is different from that of the same-age classmates. Student tasks are significantly modified, and frequent individual instructions might be required. Students who require supplementary adjustments are provided with tailored programs in some learning areas at specific times (e.g., explicit instruction, extra time). Students at the QDTP level do not need the adjustments that are made in the other three levels. They often require minor adjustments provided occasionally (e.g., active supervision). In the NCCD, student disability is determined from one of four broad disability categories including: physical, cognitive, sensory, and social/emotional (Education Services Australia, 2020a).

According to the 2018 NCCD report, 19.3% of all Australian students received an educational adjustment due to a disability. The major provision for these students the supplementary level of adjustments. This report also showed that the majority of the identified students with disabilities were identified as having cognitive disabilities. Two-thirds of students receiving extensive adjustments and approximately 60% of students receiving substantial and supplementary adjustments were students with cognitive disability. Nearly a quarter of all adjustments were also provided for students with social-emotional disabilities (ACARA, 2020). However, it must be noted that the NCCD only asks for the predominant disabilities to be identified for a student, and many students with disabilities have complex needs.

As previously mentioned, teachers in Australia are expected to make learning and assessment adjustments for students with disabilities. Accordingly, they need to understand strategies for differentiating teaching to meet the learning needs of students across the different spectrum of abilities (AITSL, 2017). The expectations of teacher knowledge and skill are based on seven professional standards. According to these standards, teachers in Australia are expected to (1) ‘know students and how they learn’; (2) ‘know the content and how to teach it’; (3) ‘plan for and implement effective teaching and learning’; (4) ‘create and maintain supportive and safe learning environments’; (5) ‘assess, provide feedback and report on student learning’; (6) ‘engage in professional learning’; and (7) ‘engage professionally with colleagues, parents/carers and the community ‘(AITSL, 2017, p. 4). According to Standard 1, teachers are required to know and understand ‘physical, social and intellectual development and characteristics of students’ (p. 10) and use ‘strategies to support full participation of students with disability’ (p. 11). These features are fully aligned to inclusive education. To enable students with disabilities to fully participate in and undertake classroom activities, teachers should consult with students, their parent(s)/carer(s) and other relevant stakeholders to make reasonable adjustments (General Comment No. 4 [CRPD]) and modify adjustments based on students’ changing needs on a regular basis (DSE, 2005). Consultation about adjustments helps students with disabilities to increase awareness of available adjustments and resources (Baker & Scanlon, 2016).

Before reviewing the empirical research findings on the impacts of instructional and assessment adjustments on academic performance, measures used to identify appropriate adjustments for students with disabilities are reviewed briefly in the following section.

2.1.3.4. Processes for Identification of Adjustments for Students with Disabilities

Teachers have an influential role in selecting adjustments to classroom assessment for students with disabilities (AITSL, 2017; Davies et al., 2018). Teachers believe that providing adjustments is beneficial to student learning and achievement (Rogers et al., 2016) and results in educational fairness (Rasooli et al., 2021). However, several researchers have claimed that it is often difficult for teachers to identify appropriate adjustments for students with disabilities (Kettler & Elliott, 2010; Saggers et al., 2016). Others have asserted that it is important that classroom teachers and special education teachers use carefully designed tools to inform how they select and provide students with disabilities with suitable adjustments in both learning and assessment conditions. In the following section, a number of instruments developed for identification of adjustments for students with disabilities will be discussed.

Elliott et al. (1998) designed the *Assessment Accommodation Checklist* (AAC) to assist teachers in the United States in planning assessment accommodations for students with disabilities during tests, especially standardised tests. The AAC consists of 67 accommodations categorised into eight domains including: assistance prior to administration of a test, motivation, scheduling, setting, assistance with test direction, assistance during the assessment, equipment or assistive technology, and changes in test format. A large number of research studies have used the AAC to investigate the effectiveness of assessment accommodations on academic achievement for students with and without disabilities (Feldman et al., 2011; Lang et al., 2008).

Fuchs and Fuchs (2001) developed the *Dynamic Assessment of Test Accommodations* (DATA) to help teachers to determine adjustments for each individual student with learning disabilities in Years 2 to 7 by testing the student under both adjusted and non-adjusted situations. Thus, the differential boost is a measure of appropriateness of adjustments for students with disabilities using the DATA. According to the differential boost hypothesis, under adjusted situations, the test scores of students with disabilities must increase more than those of students without disabilities (Elliott & Marquart, 2004); in other words, the differential effect is produced when the impacts of disability on student performance are reduced using educational adjustments.

In 2016, Davies, Elliott, and Cumming extended the AAC to develop the *Checklist of Learning and Assessment Adjustments for Students* (CLAAS) to assist Australian teachers to select, plan, and document adjustments within three situations: classroom learning (CL), classroom assessments (CA), and external national testing (National Assessment Program-Literacy and Numeracy [NAPLAN]). Following the AAC, the CLAAS lists 67 adjustments within eight categories including: motivational, scheduling, setting adjustments for learning and assessment, assistance with learning and assessment directions, assistance during the assessment, assistance prior to administering a test, equipment or assistive technology, and learning and assessment formats (Davies et al., 2016). The CLAAS has been designed to align with adjustment categories proposed by the Australian Curriculum, Assessment and Reporting Authority (ACARA, 2020). Using the CLAAS checklist, Davies and colleagues found that primary students with disabilities were predominantly provided with only 33% and 35% of adjustments proposed through the CLAAS in classroom learning and classroom assessment settings, respectively. Findings also showed that only 10% of 67 adjustment items were made for students during NAPLAN. Overall, participating primary school teachers identified the CLAAS as a useful, comprehensive tool that helped them access a list of potential adjustments for students with disabilities within both classroom instruction and assessment situations (Davies et al., 2016). In a study conducted in China, Davies et al. (2018) reported that adjustments identified by CLAAS were provided more in classroom learning situations than in classroom assessments. In the next section, empirical findings are reviewed in relation to the impacts of adjustments on students' academic achievement with disabilities.

2.1.3.5. Effectiveness of Assessment Adjustments on Academic Achievement

Most of the research on assessment adjustments and their impact on learning outcomes for students with disabilities has been conducted by researchers in the US, predominantly in the context of standardised external tests and multiple-choice test forms (Cumming, 2012). In exploring this research, the US preferred term of accommodations is used.

In such research, it has been argued that adjustments are valid and boost valid interpretation of assessment outcomes when they are only beneficial for students with disabilities, and not for students without disabilities (Giusto & Ehri, 2018; Kim, 2012). Interaction between disability status and assessment adjustments has been called the *Maximum Potential Thesis* (MPT; Zuriff, 2000). That is, when an assessment adjustment is provided, the assessment scores of students with disabilities are boosted, while those of students without disabilities are not affected. Sireci et al. (2005) modified the Maximum Potential Thesis (MPT) and suggested a *differential boost hypothesis* to explore the effectiveness of adjustments to assessment on academic achievement for students both with and without disabilities. According to the differential boost hypothesis, when an adjustment to assessment is made for students with and without disabilities, both student groups benefit but the adjustment provides a greater benefit for students with disabilities. Although the differential boost hypothesis is used to assess the validity of adjustments, it has limitations.

For example, adjustments are provided to narrow the gap between academic achievement of students with and without disabilities; however, the focus of studies is more on *success* than on *access* (Phillip, 2011).

Access is an important educational principle that aims to include not only student participation in general education classes with common curricula and assessments but also to remove barriers that limit students' opportunities to learn the designed curriculum and undertake assessments (Elliott & Kettler, 2015; Roelofs, 2019). The pivotal purpose of adjustments is to provide students with disabilities with full access to resources to demonstrate their knowledge (Davies et al., 2016; Kettler & Elliott, 2010). Thus, a careful balancing of access and success is necessary (Phillip, 2011).

Research findings on the effect of assessment adjustments on academic achievement of students with and without disabilities are varied. To gain better understanding of the effects of assessment adjustments on academic achievement, research findings are summarised into five categories. The first group of studies reported that when accommodations are provided for students with and without disabilities*, only students with disabilities benefit* (Giusto & Ehri, 2018; Fletcher et al., 2006; Kim, 2012; Zuriff, 2000). For example, the performance of South Korean students with and without visual impairment in Years 1 to 3 was compared in both accommodated (e.g., extra time, braille, and large print) and non-accommodated conditions (Kim, 2012). It was found that students with visual impairment achieved better performance in the accommodated situation, whereas no differences were found in the performance of students without disabilities, whether in accommodated or non-accommodated situations.

The second group of studies showed that when accommodations are provided for students with and without disabilities, *all students equally benefit* (Feldman et al., 2011; Fletcher et al., 2009; Meloy et al., 2002). Feldman and colleagues (2011) investigated the effects of testing accommodations on the reading performance of 48 Year 8 students with and without disabilities in the US. The reading achievement testing (TerraNova Multiple Assessment Battery, 1997) included multiple-choice, short-answer, and essay questions. Attitudinal constructs (self-efficacy, motivation, positive regard, and anxiety) were also measured using assessment pretest/posttest questionnaires. All students with disabilities had a background of academic difficulties, receiving both instructional and testing accommodations. The students were placed in four groups based on disability status (disability or no disability) and testing conditions (accommodated or non-accommodated).

Results showed that the provision of testing accommodations did not support the differential boost hypothesis on test performance of students with disabilities compared with students without disabilities. That is, both groups equally benefitted from accommodations. Other findings of this study indicated that providing testing accommodations for students with disabilities had positive effects on their self-efficacy and motivation, but not for students without disabilities, suggesting that students with disabilities were more motivated to perform better under an accommodated condition. Feldman and colleagues (2011) concluded that for students with disabilities, improvement in test-related self-efficacy and motivation might increase effectiveness of testing accommodations on students' test performance.

The third group of research studies found assessment accommodations led to *more benefits for students with disabilities* (Buzick & Stone, 2014; Gregg & Nelson, 2012; Li, 2014; Zhang et al., 2014). For example, the academic achievements of 36 boys in Ohio aged between 9 and 14 with (or at risk of) and without attention deficit hyperactivity disorder (ADHD) were compared to find out whether reading tests aloud in a small group would be an appropriate accommodation for youths with or at risk of developing ADHD. The results demonstrated that when such an accommodation was provided, the performance of the group with ADHD significantly improved, when compared with their typically developing peers (Spiel et al., 2016).

Research evidence from the fourth group of studies shows that under an accommodated situation, *students without disabilities benefit more than students with disabilities* (Elbaum, 2007; Lewandowski et al., 2008). The effect of read-aloud accommodation on the mathematics performance of 625 middle and high school students with and without learning disabilities in the south-eastern US was investigated. The results revealed that the mathematics performance of students both with and without learning disabilities improved in the accommodated condition. However, students without learning disabilities benefitted more from the read-aloud accommodation when compared with students with learning disabilities (Elbaum, 2007). Similarly, Lewandowski et al. (2008) found that high school students without disabilities benefitted significantly more from an extended time adjustment on reading comprehension test than students with learning disabilities in reading.

The fifth group of research studies failed to find a positive impact on students' test performance when students received testing accommodations (Elliott & Marquardt, 2004; Huynh & Barton, 2006; Kosciolek & Ysseldyke, 2000; McKevitt & Elliott, 2003; Meloy et al., 2002; Meyer & Bouck, 2014). For example, no difference was found between the performance of students with disabilities on a high school exit exam (without time restrictions) under an oral administration adjustment and that of students with disabilities under a standard condition (Huynh & Barton, 2006).

In summary, research findings have shown that the provision of adjustments has improved students' performance when the mode of assessment is a 'test', especially for students with disabilities. There is no equivalent body of research on the effectiveness of assessment adjustments for students with disabilities in more comprehensive modes of classroom assessment, the context for this research study.

2.1.3.6. Factors Impacting the Provision of Assessment Adjustments

In implementation, adjustments provided for students with disabilities have been shown to be influenced by a range of factors. These factors include students' feelings and attitudes, student familiarity with adjustments, year level, subject area, adjustment to method of delivery, and type of examination questions and inappropriate adjustments. These are discussed in the following sections. Again, it is noted that these research findings are predominantly in the context of 'test' modes of assessment, including standardised tests.

2.1.3.6.1. Students' Feelings and Attitudes

Making a decision about whether to implement assessment adjustments must take into account the difficulties that provision of adjustments can cause for students with disabilities, since receiving this kind of 'special help' from teachers can lead such students to think that their classmates might consider them 'dumb' (Feldman et al., 2011, p. 85) and therefore feel embarrassed about receiving adjustments (Baker & Scanlon, 2016; Witmer et al., 2018). As a result, the investigation of attitudes of students with disabilities towards adjusted conditions may provide an important insight into how to make assessment adjustments more effective.

Attitudes of students with and without disabilities have been compared in accommodated and non-accommodated conditions in many research studies. Reasons why many students with disabilities prefer accommodated conditions might be related to motivational factors such as increased confidence about doing well in tests (Feldman et al., 2011). For example, in Kosciolek and Ysseldyke’s (2000) study, the perception of 32 students in Years 3 to 5 in the US were investigated within two different test administrations — one in which students were provided with read-aloud accommodations, and the other where students were assessed in the standard condition. The majority (75%) of students who were receiving special education services preferred the accommodated administration because they found the test much easier in that format, whereas 76% of students without disabilities preferred the standard administration. Students without disabilities believed that it was faster to answer test questions when they were responding at their own pace, rather than at the pace set by the reader.

Similarly, a study by Kim (2012) investigated the attitude of students with visual impairment towards an adjusted condition in South Korea. Findings showed that students with visual impairment felt more comfortable when a read-aloud adjustment was provided. Having a test read aloud gave them more opportunity to complete it faster. They believed that reading braille required more time, especially when students were required to read long passages for multiple-choice questions. However, students without disabilities preferred the standardised condition. These students stated that they felt they not only did not have enough time to think of the responses in the read-aloud situation, but also that their speed of response could not be matched with the speed at which a person read the test.

Moreover, Feldman et al. (2011) investigated the effects of accommodations on adolescents' self-efficacy and test performance and found that when adjustments were provided for students with disabilities, the majority felt more comfortable, and were confident about their capacity to do well. The students stated that adjustments gave them more opportunities to use different strategies to check their work and therefore felt more motivated to work harder to do better on tests.

2.1.3.6.2. Year Level

Research has found that students with disabilities may perform differently under adjusted conditions across year levels (Buzick & Stone, 2014; Li, 2014). For example, the mathematics performance of elementary students with learning disabilities was better than their peers without learning disabilities when a read-aloud adjustment was provided; however, middle school students did not gain the same benefit (Helwig et al, 2002). In addition, the result of Elbaum's (2007) meta-analysis study showed that provision of read-aloud adjustments for a mathematics test made a greater differential boost for elementary school students, whereas the converse was true for secondary school students, that is, mathematics performance of students without disabilities was better than that of students with disabilities. Laitusis (2010) also reported more support for higher performance in Year 4 than Year 8, when a read-aloud adjustment was made for students with and without learning disabilities on tests of reading comprehension.

2.1.3.6.3. Subject Area

Much research evidence has shown that students' mathematics and reading performance is different when assessment adjustments are provided (Buzick & Stone, 2014; Li, 2014; Elliott & Marquardt, 2004; Lang et al., 2008). For example, effects of assessment adjustments on mathematics and reading scores were measured for Years 4 and 8 students with and without disabilities (Lang et al., 2008). The findings indicated that both students with and without disabilities benefited from assessment adjustments on reading assessments, although students with disabilities benefited more**.** However, a differential boost was not found for mathematics (Lang et al., 2008). Similarly, results of Buzick and Stone's (2014) meta-analysis study on a read-aloud accommodation showed that reading assessment scores increased significantly more than mathematics test scores for students both with and without disabilities, although students with disabilities demonstrated greater benefit.

2.1.3.6.4. Adjustments to Method of Delivery

The effectiveness of assessment adjustments may be influenced by the method through which a specific adjustment is delivered. For instance, Li's (2014) meta-analysis study indicated a stronger effect was found when a mathematics test was read aloud by a person than when it was read by computer, or video/audio players. Calhoon et al. (2000), however, did not find significant differences on mathematics performance among teacher-read, computer-read, and computer-read with video adjustments for secondary school students with learning disabilities.

Other research evidence has shown that students with disabilities and students without disabilities but identified as having reading difficulties scored significantly higher under accommodated testing conditions (teacher read-aloud and podcast read-aloud) than with standard administration (McMahon et al., 2016). In addition, students without disabilities benefited more than students with disabilities from teacher read-aloud accommodation while no difference was found between students with and without disabilities through a podcast testing accommodation (McMahon et al., 2016). These researchers stated that using podcasts as accommodations during an examination encouraged students to be more independent and to have self-paced access to the assessment content (McMahon et al., 2016).

2.1.3.6.5. Type of Examination Questions

The academic performance of students with disabilities can be influenced by the type of examination questions. For example, the effectiveness of assessment adjustments on mathematics performance of 86 students with and without disabilities in Grade 4 was studied (Schulte et al., 2001). Results showed that students with disabilities have higher mathematics achievement than students without disabilities on multiple-choice items, but not on constructed-response items, under the adjusted conditions.

In summary, the previous studies have shown that the provision of assessment adjustments is affected by a range of the moderator variables (e.g., student perception of adjustments), which in turn impact students' academic achievement with disabilities. Awareness of these factors may be influential in deciding to make suitable adjustments.

2.2. Academic Wellbeing

The other important aim of this study is to investigate academic achievement in relation to academic wellbeing for students with and without disabilities. Academic wellbeing has been conceptualised in this study as comprised of academic self-concept, academic responsibility, and school satisfaction. First, the conceptualisation of academic self-concept and the relationship between academic achievement and academic self-concept for students with and without disabilities are presented. Second, the definition of academic responsibility is presented, then the relationship between academic achievement and academic responsibility for students with and without disabilities with respect to the previous studies are described. Finally, the literature on school satisfaction of students with and without disabilities in relation to academic achievement is presented.

2.2.1. Self-concept

2.2.1.1. Conceptualisation of Self-concept

Many students may experience difficulties in school not because they are not capable of performing successfully, but because they *believe* that they cannot perform successfully (Bandura, 1982, 2001; Pajares, 2001). A healthy sense of self is not only a desirable educational goal itself (Education Council, 2019b), but also supports other educational goals such as academic achievement (O'Donnell et al., 2016; Susperreguy et al., 2018). Self-concept, broadly speaking, refers to an individual's perception of his or herself, and this perception begins to appear before the age of two as a result of daily experiences, interpretations of one's environment, and feedback provided by significant others in one's life such as parents, teachers, and peers (O'Donnell et al., 2016; Shavelson et al., 1976). Self-concept includes feelings of self-acceptance, competence, and ability (Marsh & Scalas, 2010). Thus, self-concept is a suppositional construct that is used to explain and predict how an individual acts in different situations (Shavelson et al., 1976).

Having a positive self-concept is an important factor associated with success at different life stages, especially during adolescence. In this vital period, adolescents experience a number of considerable developmental changes (e.g., physical, social, and cognitive). For example, according to Piaget's (1936) theory of cognitive development, cognitive development that takes place during adolescence enables individuals to think about abstract concepts associated with their own attributes and abilities (e.g., 'I am smart', 'I am ambitious'). Harter (2015) claimed that it is during this phase that adolescents define themselves based on their thoughts, beliefs, and values rather than physical traits (e.g., I have brown eyes). In this study, self-concept is discussed from the perspective of Bandura's social cognitive theory (1982), which will be discussed in the following section.

2.2.1.2. Theoretical Framework: Social-Cognitive Theory

A fundamental tenet of social cognitive theory is that human learning depends on reciprocal interactions among personal factors (e.g., beliefs, skills), one's behaviour (e.g., effort, persistence, achievement), and social/environmental conditions (e.g., feedback, instruction, educational adjustments). According to Bandura (1989),

> personal and environmental factors do not function as independent factors, rather they determine each other. Nor can persons be considered causes independent of their behavior. It is largely through their actions that people produce the environmental conditions that affect their behaviors in a reciprocal fashion. The experiences generated by behavior also partly determine what individuals think, expect, and can do, which in turn, affect their subsequent behaviour. (p. 32)

Personal factors involve cognitions, perceptions, beliefs, and feelings (Schunk & DiBenedetto, 2020) that help provoke and maintain motivational outcomes. In this study, the personal influences include self-concept, academic responsibility, school satisfaction and social comparisons. Academic achievement is regarded as a behavioural factor that affects personal and environmental processes and is affected by them. In this section, the focus is on self-concept and social comparisons. A student who feels competent about performing well in a school subject (personal) is more likely to engage in activities that will help their learning (behavioural, i.e., learning strategies, persistency). Further, feedback that a student receives on their progress (environmental) may enhance self-concept and motivate them to proceed to engage in learning activities (behavioural; Schunk & DiBenedetto, 2020).

Self-concept is therefore a dynamic set of self-beliefs that shows how internal beliefs determine personal capacity to achieve success. Bandura (2012) posited that self-belief also determines reactions when confronting barriers. For example, students avoid potential learning opportunities because they feel they cannot succeed in and undertake activities. Collectively, how students perform can be attributed to what they perceive they can do. In this study, social cognitive theory is used to examine how students with and without disabilities perceive their academic abilities and experiences in relation to academic achievement.

Social comparisons also impact on shaping a student's self-concept in academic contexts (Schunk & DiBenedetto, 2020). The term social comparison, which was first proposed by Festinger (1954; cited in Buunk & Gibbons, 2005), describes one of the main social cognitive processes that can have motivational effects on individuals (Schunk & Usher, 2012). Social comparison refers to the process of evaluation of our own opinions and abilities by comparing them with the opinions expressed and abilities demonstrated by other people

(Bandura, 1982). It is inevitable that students evaluate and compare themselves with other students, and without peers around, it is difficult to know whether they are capable or sociable; therefore social comparison is vital to the development of one's self-concept (O'Donnell et al., 2016; Schunk & DiBenedetto, 2020). In self-concept research, if social comparisons result in negative self-evaluation, an individual's self-concept and motivation can be reduced (e.g., everyone solved the problem except me), while an individual who thinks that they performed better than others becomes more motivated and develops a higher self-concept (Schunk & Usher, 2012). This comparison may be especially effective in the case of individuals with disabilities or those who have self-doubts about working well; otherwise, comparisons can have a negative impact upon individuals' self-concept (Schunk & Usher, 2012). How social comparisons connect to self-concept in academic settings is described by the big-fish-little-pond-effect (BFLPE; Marsh, 1984), presented in the next section.

2.2.1.3. Theoretical Models of the Self-Concept Construct

2.2.1.3.1. The Multidimensional, Hierarchical Model of Self-concept

In early studies, self-concept was considered a unidimensional construct (Coopersmith, 1967). However, this view was challenged by researchers who came to consider self-concept as a multidimensional construct (Shavelson et al., 1976). The conceptualisation of self-concept developed slowly because of the difficulty of measurement and the lack of consistent findings (Shavelson et al., 1976). Through an extensive review, Shavelson et al. (1976) proposed a multidimensional, hierarchical model of self-concept. This model has been the foundation for the study of self-concept undertaken as part of the research presented in this thesis. In the model, seven features are considered critical in the definition of self-concept:

(1) Self-concept is an *organised or structured* construct, in which individuals categorise the large amount of information they have about themselves and relate these categories to one another;

(2) It is *multi-faceted* — people's perception of themselves includes different subdomains such as social acceptance, physical attractiveness and abilities;

(3) It is a *hierarchical* construct, in which general self-concept is at the apex of the hierarchy, and for educational purposes, is divided into academic self-concept and non-academic self-concept facets. Academic self-concept can be further divided into subject-specific subareas: for example, English, history, mathematics, and science. This model also divides non-academic self-concept into social self-concept (e.g., relations with peers and relations with parents), emotional self-concept, and physical self-concept components (e.g., physical competence and attractiveness); which are related to separate and more specific subareas (e.g., physical self-concept is divided into physical ability and physical appearance facets);

(4) General self-concept is more *stable* compared with more specific domains. As one descends the hierarchy, self-concept becomes more situation-specific and is amenable to change. As a result, at the bottom of the hierarchy, subareas are less stable compared with general self-concept (Wang & Su, 2013).

(5) Self-concept is *developmental*. As individuals move from childhood to adulthood, the multidimensionality of self-concept increases. During childhood, children's self-

concept is global and undifferentiated. As children mature, their self-concept becomes more differential;

(6) It has a *descriptive and an evaluative* character, which means that an individual not only can describe themselves (e.g. ‘who I am’ or ‘I am happy’), but can also evaluate themselves (‘I am good at writing’ or ‘I do well in mathematics’);

(7) It is differentiable; in other words, although it is theoretically related to other psychological and behavioural constructs, it can be differentiated from others. For example, self-concept in mathematics does not need to be substantially correlated with self-concept in English.

This multidimensional model of self-concept has not only led to numerous studies employing it as part of their theoretical frameworks, but has also provided a theoretical and methodological framework for the development of multidimensional self-concept instruments that can provide strong evidentiary support for the model (Marsh & Scalas, 2010). Following the Shavelson et al. model, Marsh developed a set of Self Description Questionnaires (SDQ; e.g., Marsh & O’Neill, 1984) that comprise a comprehensive self-concept instrument compared with other self-concept measures (Marsh & Scalas, 2010). The Self Description Questionnaires also have three versions for Australian children (SDQI), adolescents (SDQII), and young adults (SDQIII) respectively. Each version has three domains (academic, non-academic, and global self-concept) and the number of items in each domain differs between each scale (Marsh & O’Neill, 1984).

2.2.1.3.2. The Definition of Academic Self-concept

Academic self-concept is one of the fundamental components of global self-concept (Shavelson et al., 1976) that has received attention in many educational psychology studies because of its considerable direct and indirect effects on educational outcomes such as academic achievement and motivation (Fu et al., 2020; Wu et al., 2021). Academic self-concept refers to students' knowledge and perceptions of themselves in learning contexts (Shavelson & Bolus, 1982). In this study, the focus is on the academic self-concept of secondary school students with and without disabilities. During elementary school, students' academic self-concept is affected by the process of forming and reforming that is increasingly dominated by academic success and failure (Skaalvik & Hagtvet, 1990). The motivational characteristics of academic self-concept have not been sufficiently developed, and therefore their impact on achievement is limited (Helmke & van Aken, 1995). Academic self-concept is expected to influence academic achievement when it is more stable (Wigfield & Karpathian, 1991). Additionally, the level of academic self-concept reduces during adolescence (Marsh & Ayotte, 2003; Molloy et al., 2011), and this group of students are at most risk in education and wellbeing (Elmore & Huebner, 2010; Wyatt-Smith et al., 2017). Thus, this period is an important context to scrutinise.

2.2.1.3.3. The Marsh and Shavelson Model of Academic Self-concept

Although results of studies based on Self Description Questionnaires have provided strong support for the Shavelson et al. (1976) multidimensional model, the *hierarchical* component of this model required that the different dimensions of academic self-concept would be considerably correlated (Marsh et al., 2012). For example, a significant relationship between mathematics self-concept and verbal (native language) self-concept would be expected. However, research findings have indicated that verbal and mathematics self-concepts are nearly unrelated with each other and could not merge into a single academic self-concept (Möller et al., 2009). These deficiencies in the Shavelson et al. model led to the revision of the original model. Therefore, Marsh and Shavelson (1985) proposed two second-order academic factors (reading academic self-concept and mathematic academic self-concept) and a second-order non-academic factor. In other words, three components (non-academic self-concept, reading academic self-concept, and mathematics academic self-concept) occurred in the second order of the revised model of self-concept, while there were two academic and non-academic components in the second order of the Shavelson et al. model (1976).

2.2.1.3.4. Internal/External Frame of Reference Model (I/EM)

The Internal/External Frame of Reference Model (I/EM) was developed by Marsh (1986) to explain why mathematics and verbal self-concepts are so distinct and uncorrelated. According to this model, an individual's mathematics and verbal self-concepts are based on two different, but connected, frames of reference: external (social comparison process) and internal (dimensional comparison process). First, students compare their achievement with their classmates' achievement within the same school subjects (external frame of reference). Second, students engage in a dimensional comparison process, comparing their achievement in a subject with their own achievement in other school subjects. For example, 'how good am I in mathematics compared to English?' As a result, students may have a good mathematics self-concept when mathematics is their best subject, even if they do not show good performance in mathematics compared with their classmates (Marsh et al., 2015). In the external comparison process, there is a positive relationship between mathematics and verbal self-concepts, because mathematics achievement and verbal achievement are considerably related, while the internal comparison process leads to a negative correlation between mathematics and verbal self-concepts; and finally, the joint operation of two processes leads to a near-zero correlation between mathematics and verbal self-concepts. Researchers have also shown that the external and internal models can be generalised to students with disabilities (Möller et al., 2009).

2.2.1.3.5. The Self-enhancement Model and the Skill-development Model

A growing body of research has shown that academic achievement and academic self-concept are strongly related (Fu et al., 2020; Susperreguy et al., 2018). However, the relationship of academic self-concept and academic achievement leaves an important research question unanswered, namely, whether high or low academic self-concept leads to high or low academic achievement or high or low academic achievement leads to high or low academic self-concept (Marsh & Köller, 2004).

To explain the causal ordering of self-concept and academic achievement, Calsyn and Kenny (1977) compared the self-enhancement model with the skill-development model. According to the self-enhancement model, academic self-concept is the main determinant of academic achievement (academic self-concept → academic achievement) and enhancing an individual’s academic self-concept promotes academic achievement. Thus, self-enhancement thinkers believe that considerable time and effort must be devoted to boosting students’ self-concept in educational programs**.** By contrast, according to the skill-development model, academic self-concept is seen as the result of previous academic achievement (academic achievement → academic self-concept). Therefore, for example, one way to enhance academic self-concept is to improve students' academic skills through better structuring of curriculum (Calsyn & Kenny, 1977).

2.2.1.3.6. The Reciprocal Effects Model (REM)

Marsh (1990) has criticised both the self-enhancement and skill development models, arguing that the models are too simplistic, methodologically unsound, and inconsistent with self-concept theory. Therefore, Marsh (1990) suggested the reciprocal effects model (REM) in which prior academic achievement affects subsequent self-concept and prior academic self-concept affects subsequent achievement. In this model, academic self-concept and academic achievement mutually affect each other, and thus it is argued both models (the self-enhancement model and the skill-development model) should be targeted simultaneously in educational settings (Marsh et al., 2012). Marsh and Martin (2011) suggested:

> If teachers enhance students' academic self-concepts without improving achievement, then the gains in self-concept are likely to be short-lived. However, if teachers improve students' academic achievement without also fostering students' self-beliefs in their academic capabilities, then the achievement gains are also unlikely to be long lasting. If teachers focus on either one of these constructs to the exclusion of the other, then both are likely to suffer. Hence, according to the reciprocal effects model, teachers should strive to improve simultaneously both academic self-concept and achievement. (p. 72)

The REM has been employed in many studies and gained strong empirical support for secondary school students (Grygiel et al., 2016; Wu et al., 2021). As mentioned previously, the I/EM was created based on social and dimensional comparisons, whereas the REM includes the temporal (i.e., students relating their current achievement to prior achievement in the same domain) and social comparisons (Marsh et al., 2015). The reciprocal Internal/External Frame of Reference Model (RI/EM) combines social, temporal, and dimensional comparisons to shape and maintain an academic self-concept (Möller et al., 2011). The empirical evidence for the RI/EM is still inadequate as this model has been developed recently (Möller et al., 2014; Wolff et al., 2018). A meta-analysis was conducted by Möller et al. (2020) regarding the relationship between academic achievement and academic self-concept. Their findings demonstrated that academic achievement more strongly predicts academic self-concept, emphasising social comparisons that students make.

2.2.2.7. The Big-Fish-Little-Pond Effect Model (BFLPE)

In order to understand the external frame of reference effects in educational settings, Marsh (1984) developed a frame of reference termed ‘the big-fish-little-pond effect’. As mentioned previously, students compare their academic abilities with those of their classmates and employ social comparison in forming their own academic self-concept. A negative big-fish-little-pond effect occurs when students compare themselves with students demonstrating higher ability in the same classroom and as a result develop a lower self-concept. When they compare themselves with less able students or with students demonstrating the same level of capability, therefore, they may develop a higher self-concept.

Students' academic self-concept not only depends on their academic abilities, but also changes based on the type of school they attend. Therefore, the big-fish-little-pond effect can be an example of an external frame of reference that may have an effect on some students attending selective schools. For example, in the case of a student who has been evaluated as a top student in primary school and accepted to attend a selective high school, in the new school they may develop a below average or average academic self-concept after comparing their academic abilities with those of other top performing students. In the new school, they will no longer be a big fish (top student) in a small pond, but rather feel that they are in a large pond full of big fish.

The research evidence is especially important when considering self-concept of students with disabilities. For example, students with disabilities placed in mainstream classes may develop a lower self-concept because of the social comparisons that they make. However, when students with disabilities are grouped in classes of students sharing similar disabilities, or when the average ability of the school students is lower, it is predicted that they will have higher academic self-concept (Crabtree, 2003; Mulat et al., 2019; Szumsk & Karwowski, 2015). Students with disabilities tend to compare themselves to their similar ability peers to protect and promote their perception of academic abilities (Szumsk & Karwowski, 2015). For example, the academic self-concept of fifteen-year-old students with special needs from 41 countries in both special and mainstream classes was compared. Findings showed that students who moved to special classes reported higher academic self-concept and more favourable social comparisons than their counterparts in mainstream classes. According to the big-fish-little-pond model, placement in a mainstream class may decrease the academic self-concept of students with disabilities, and as a result, it is more likely that they feel less academically capable in comparison with other students with disabilities who are placed in special classes (Dixon, et al., 2008).

In summary, studies on academic self-concept have considerably advanced during the past four decades. Multidimensionality of academic self-concept and its relationship with academic achievement is well documented in research literature. The big-fish-little-pond effect model has yielded detailed insights about the formation and development of students' academic self-concept with disabilities. In the following section, a summary of research studies conducted on the academic self-concept of students with and without disabilities is presented.

2.2.1.4. Academic Self-concept of Students with and without Disabilities

The preceding discussion has pointed to how having a positive self-concept has been identified as an important element in students' success at school. This is particularly important for students with disabilities who are at higher risk of developing a low self-concept as they come to see themselves as less capable than others through the social comparison process (Mulat et al., 2019). A large body of studies on self-concept of students with disabilities has focused on students with learning disabilities (Brabcová et al., 2015; Zeleke, 2004). This group of students is particularly at risk of developing a lower academic self-concept because they tend to attribute repeated failures to their disabilities (Crabtree, 2003). By contrast, research findings on academic self-concept of other groups of students with disabilities are mixed. To gain better understanding of academic self-concept of students with and without disabilities, research findings are summarised into three groups.

The first group of studies found that *the academic self-concept of students with disabilities is lower than students without disabilities* (e.g., Brabcová et al., 2015; Mulat et al., 2019; Datta & Talukdar, 2016). For example, using the Tennessee Self-Concept Scale (Fitts & Warren, 2003), Datta and Talukdar (2016) investigated the academic and general self-concepts of 25 adolescents and adult students with vision impairment aged between 15 and 25 in South Australia. Participants were recruited from schools in the Department for Education and Child Development (DECD) and Technical and Further Education (TAFE) sectors and enlarged and braille versions of the Tennessee scale were completed by students. The findings indicated that the majority of students with vision impairment showed below average scores in academic self-concept (40% of the female and 76% of male students) and general self-concept (85% of female and 100% of male students) (Datta & Talukdar, 2016).

The second group of research studies *failed to find a difference in the academic self-concept of students with and without disabilities* (Halder & Datta, 2012; McCauley et al., 2018). For example, mathematics and reading self-concepts of students with autism spectrum disorder (ASD) and students without disabilities in Years 3 to 11 were compared (McCauley et al., 2018). The Self Description Questionnaire II (Marsh, 1992) was used to assess mathematics and reading perception of students. Numerical operation and problem solving from Wechsler Individual Achievement Test (WIAT-III; Wechsler 2010) and the Gray Oral Reading Tests were also used to assess mathematics and reading performance, respectively. No significant differences were found on mathematics and reading self-concepts between students with ASD and without disabilities. In addition, mathematics self-concept was positively related to mathematics performance in both groups. A positive association was also found between reading self-concept and reading performance for students without disabilities, but not for individuals with ASD (McCauley et al., 2018). McCauley et al. suggested that individuals with ASD have more accurate self-concept in mathematics but not in reading. This difference may be a result of the type of feedback that they receive in these subjects. For example, in mathematics, students can evaluate competency based on getting answers correct or understanding specific concepts. However, it is often harder to define what being competent at reading may be.

In the Halder and Datta (2012) study, the self-concept of 100 sighted students and 60 students with visual impairment aged between 15 and 18 was compared in India using the Piers-Harris Self-Concept Scale (Piers, 1984). Selected students in special schools whose visual acuity did not exceed 20/200 were matched with peers in mainstream schools based on age, year level, and socio-economic status. The results showed that although sighted students scored higher than students with visual impairment in terms of their general self-concept, there was no difference among them in regard to intellectual and school status dimensions.

Gans and his colleagues (2003) compared the self-concept scores of 50 Grades 6 to 8 students with learning disabilities enrolled in exceptional student education with those of 70 of their peers without learning disabilities in the US. The Piers-Harris Children's Self-Concept Scale (Piers, 1984) was undertaken as a group-administrated scale in the classroom, with a researcher reading items aloud for students. The scale consists of six subdomains: physical appearance and attributes, anxiety, intellectual and school status, behaviour, happiness and satisfaction, and popularity. No differences were observed in regard to the self-concept of students in the two groups.

The third group of studies found *positive levels of academic self-concept for students with disabilities*. For example, the self-concept of 64 students with Down syndrome was assessed in three domains of academic competence, physical competence and social acceptance in mainstream and special schools in UK. Three self-domains were also compared for three age groups (8 to 10 years, 11 to 13 years, and 14 to 16 years). The findings showed that students with Down syndrome had higher self-concept in the areas of academic and physical competences compared with the area of social acceptance. In addition, students' academic self-concept was lowest for the students who were 11 to 13 years old. Although the type of school setting did not significantly influence students' self-concepts, students with Down syndrome in mainstream schools had more positive self-concept than students in special schools (Begley, 1999).

In a Spanish study by Cambra and Silvestre (2003), the self-concept of students with disabilities (including hearing, motor, visual, relational, learning and intellectual disabilities) and students without disabilities aged between 10 and 14 years was compared. Findings showed that students with disabilities overall had positive academic self-concepts, although their academic self-concepts were significantly lower compared to their peers without disabilities.

In summary, although the research findings on academic self-concept of students with and without disabilities are mixed, results generally show that students within different groups of disabilities have lower perception of academic ability than their peers without disabilities. This may reflect that they have experienced more repeated failure in school. Further, poor academic self-concept among students with disabilities may be the result of social comparisons that they make with students without disabilities.

2.2.1.5. Academic Achievement and Academic Self-concept for Students with and without Disabilities

Research evidence suggests that academic self-concept is related to academic achievement for students without disabilities (Marsh & Martin, 2011; Susperreguy et al., 2018; Wu et al., 2021), while for students with disabilities the relationship between academic self-concept and academic achievement is reported to be relatively insignificant or non-significant (Bailey et al., 2018). Standardised tests are used in most studies to investigate the relationship between academic achievement and academic self-concept. However, achievement, using school grades, tends to be closely linked to academic self-concept than standardised tests (Wu et al., 2021).

A few studies have investigated the relationship between academic self-concept and academic achievement among students with disabilities. For example, the relationship between academic achievement and self-concept was examined among 37 students with learning disabilities aged between 8 and 14 years (Houck & Houck, 1976). Participants were drawn from private self-contained programs and resource rooms in a public-school setting, and the Primary Self-concept Inventory (Muller et al., 1975) was used to measure self-concept. No significant differences were found in regard to either academic achievement or self-concept between the two groups (self-contained and resource). The findings showed a small but significant correlation between academic achievement and self-concept among students with learning disabilities.

By contrast, Möller et al. (2009) reported different outcomes. They explored the relationship between academic achievement and academic self-concept among a group of

Grade 5 to 9 students with learning disabilities who attended schools for students with disabilities in Germany. The results showed that mathematics self-concept was positively and significantly correlated with mathematics achievement, and there was also a significant positive correlation between German language self-concept and German language achievement. In addition, examination of the relationship between mathematics and German language self-concepts and mathematics and German achievement showed that the mean correlation between mathematics self-concept and mathematics achievement (mean r =.51) was higher than the mean correlation between German language achievement and German language self-concept (mean r =.34). The findings of this study also provided evidence that the Marsh I/E model (1990) can be generalised to students with learning disabilities.

It is important to note that the relationship between academic self-concept and achievement among students with disabilities has been shown to be influenced by many personal factors. For example, students with less negative perceptions of their disabilities have higher academic and global self-concepts (Rothman & Cosden, 1995; Zeleke, 2004), higher mathematics achievement (Rothman & Cosden, 1995), and higher reading accomplishment (Heyman, 1990) than students who viewed their disabilities more negatively. On the basis of these results, it is evidenced that findings examining the relationship between specific domains of academic self-concept and academic achievement among students with disabilities are mixed, and so further studies exploring this relationship are needed.

2.2.2. Academic Responsibility

Students require not only proficient academic skills, but also non-academic skills such as motivational beliefs to achieve academic success (Schunk & DiBenedetto, 2020). As children get older, they find more opportunities and experiences that enable them to learn about the relationship between their actions and the consequences they experience (Shogren et al., 2010). It is therefore important that children take and accept responsibility for consequences of their actions. Although the term academic responsibility is considered as a key component in motivation studies, its definition is difficult. Academic responsibility beliefs have also been regarded as synonymous with constructs such as academic locus of control (Rogers & Saklofske, 1985). The construct of locus of control was originally operationalised by Rotter (1966) and refers to personal beliefs about whether the consequences of our actions are contingent on what we do; or rather depend on outside factors that are not under our control (Shepherd et al., 2006). Maier and Seligman (1976) stated that 'when events are uncontrollable (e.g., task difficulty, intelligence, and examination setting) the organism learns that its behaviours and outcomes are independent, and this learning produces the motivational, cognitive, and emotional effects of uncontrollability' (p. 3).

Unlike self-concept that occurs before and during actions, attributions appear afterwards and judge why consequences occurred (Schunk & DiBenedetto, 2020). The causes that students use to explain their success or failure for school academic outcomes can either be internal or external (Rotter, 1966). Generally, students with higher internalised academic responsibility are characterised to demonstrate higher task persistence and higher expectations for their future academic achievement (Çelik & Sarıçam, 2018; You et al., 2011) than students with lower academic responsibility. In addition, students with higher responsibility for academic outcomes not only show greater academic achievement, but also have higher self-efficacy for learning (Zimmerman & Kitsantas, 2005). They also tend to develop internally-oriented beliefs for academic successes (Onyekuru & Ibegbunam, 2014; Shepherd et al., 2006; You et al., 2011). For example, they believe that academic success in an examination is the result of a great amount of their efforts and persistence (Bandura, 2001). They often implement self-monitoring strategies and modify their actions when they experience failure to achieve desirable academic outcomes (Perry et al., 2005). In addition, if such an individual experiences academic failure, this would more likely be attributed to their failure in the area of controllable factors, such as not studying hard enough, and therefore it may increase their motivation to work harder to achieve better outcomes in the future.

By contrast, students with externally-oriented beliefs perceive their academic failure to be the result of lack of ability, an unfair test or perhaps as their teachers' fault; they feel that they cannot change or have little control over such outcomes themselves, and therefore may not change their approach in facing upcoming challenges in school tasks (Hadsell, 2010). Overall, students with externally-oriented beliefs should be educated that their unsuccessful academic experiences might be due to internal controllable factors, for example, insufficient effort and/or poor study strategies (Soric, 2009). Thus, enhancing their persistence and effort at learning tasks helped them to improve their academic achievement.

The formation of internality or externality of personal beliefs can also be affected by social comparison processes. For example, when a student's academic achievement is much better than most of their classmates, success may be seen as the result of their own ability or effort; but when a student achieves equally poor academic results as most of their classmates, failure may be attributed to factors such as bad luck or task difficulty (Faber, 2019).

2.2.2.1. Academic Responsibility and Academic Achievement

The role of perceived responsibility beliefs in students' academic success and failure has been examined in educational research. Research evidence has shown that students' perceptions of academic responsibility can directly and indirectly influence their academic outcomes (Çelik & Sarıçam, 2018; Witmer et al. 2015; You et al., 2011). For example, the mediating role of perceived responsibility beliefs and self-efficacy for learning in the relationship between homework practices and academic achievement was examined (Zimmerman & Kitsantas, 2005). The Perceived Responsibility Scale (PRS; Zimmerman & Kitsantas, 2005) was used to assess whether students perceive themselves or their teachers to be more responsible for their academic achievement. Findings showed that students with higher perceptions of academic responsibility had higher academic achievement and self-efficacy for learning and believed that they are more responsible for their academic outcomes than their teachers. The study also found that perceived responsibility beliefs mediate the relationship between the quality of students' homework and academic achievement (Zimmerman & Kitsantas, 2005).

In a large-scale longitudinal study, the relationship between perceived control and academic achievement among Grade 8 students was investigated in the US, followed up in Grades 10 and 12 (You et al., 2011). Students' scores in Grade 12 reading, mathematics, and science, and the Pearlin Mastery Scale (Pearlin et al., 1981) were used to assess academic achievement and perceived control beliefs, respectively. The researchers found that perceived control is a stable construct during the adolescent period that directly impacts on subsequent academic achievement. They argued that if classroom instruction relies upon strategies that emphasise students' abilities, skills and effort, it is more likely that students develop a sense of control over their learning process, and in turn improve their academic achievement (You et al., 2011).

In the study conducted by Park and his colleagues (2020), the relationship of locus of control and reading and mathematics achievement was examined among secondary school students with learning disabilities, speech impairment, and emotional disturbance in the US. Findings indicated that internal locus of control and reading and mathematics achievement were significantly associated. This finding reflects that students may perceive that they have control over their outcomes when they were performing well. As a result, they tended to attribute their progress to internal factors than external factors. No difference was found in the locus of control scores across the three groups of disabilities. However, students with learning disabilities and students with speech impairment showed the lowest and highest performance on reading and mathematics domains respectively. Overall, students' control beliefs and social comparison that they make, can influence their perceived responsibility beliefs for success and or failure in school.

2.2.2.2. Academic Responsibility among Students with and without Disabilities

Research studies have revealed that students with disabilities have a different approach to taking academic responsibility compared with students without disabilities, showing external-oriented beliefs for their school experiences. For example, Rogers and Saklofske (1985) investigated academic responsibility beliefs, performance expectations of learning and academic self-concept of students with and without learning disabilities. The Intellectual Achievement Responsibility Questionnaire (Crandall et al., 1965) and the Student's Perception of Ability Scale (SPAS: Boersma & Chapman, 1979) were employed to assess academic responsibility and academic self-concept respectively. Results indicated that students with learning disabilities tended to take less internal responsibility for their academic success and failure than students without disabilities. They also had lower academic self-concept and expectation for future success than students without disabilities. Rogers and Saklofske (1985) believed that students with lower academic responsibility often use defence mechanisms to protect themselves from negative feelings by blaming external factors for their academic failure experiences.

In addition, Núñez and colleagues (2005) conducted a cluster analysis to examine differences in academic self-concept and causal attributions for students with learning disabilities. Two subgroups of students with learning disabilities emerged based on their attributional profiles: students with an adaptive profile (internalisation of success and externalisation of failure) and students with the helplessness profile (internalisation of failure and externalisation of success). Results showed that students with an adaptive profile not only believed that their academic success is the result of their abilities and sufficient efforts, but also had higher self-concept in mathematics, reading, and general school than their peers with the helplessness profile. By contrast, students with the helplessness profile perceived their academic failure as lack of ability and effort. No differences were found in intellectual skills between both subgroups. Overall, Núñez and colleagues (2005) concluded that students with more academically successful experiences were more likely to believe in their abilities and efforts and take more academic responsibility, and therefore to experience higher academic achievement.

In an Australian study by Tabassam and Grainger (2002), academic self-attribution and academic self-concept of 44 students with learning disabilities and 42 students with learning disabilities and attention deficit/hyperactivity were compared with 86 normally achieving students in Grades 3 through 6. The Self Description Questionnaire (SDQ-1; Marsh, 1990) and Academic Attributional Style Questionnaire (e.g., that story was easy to read) were utilised to assess participants' academic self-concept and self-attribution in academic situations. Both groups of students with disabilities spent one to two hours a day in resource rooms for specialist academic assistance. Results indicated that both students with learning disabilities and students with co-morbid reading and attentional problems showed lower academic self-concept (reading and mathematics self-concepts) than students without disabilities. They also tended to have high negative attributional styles in academic areas and attributed their academic failures to internal causes such as lack of ability or not understanding the material, than the students without disabilities.

In a cross-sectional study, the development of academic responsibility in students with learning disabilities, intellectual disabilities, and students without disabilities was examined. A total of 1,344 elementary, middle, and high school students aged between 8 and 20 were assessed by the Intellectual Achievement Responsibility Questionnaire (IAR; Crandall et al., 1965) in the US (Shogren, et al., 2010). The results revealed that internal responsibility for academic success did not change over time, while internal responsibility for academic failure increased over the age range. The findings also showed that although students without disabilities had higher scores for internal responsibility for academic success than students with intellectual disabilities, no difference was found in internal responsibility for academic failure among three groups. Overall, empirical research has shown that students with disabilities may have low internal responsibility and tend to assign external responsibility for their academic success and failure experiences.

2.2.3. School Satisfaction

For all students, school is a main setting of learning and socialisation experiences and therefore the quality of their time at school plays an important role in different domains of their life satisfaction (Ng et al., 2015). Life satisfaction is generally defined as the evaluation of one's life based on a collection of self-selected criteria (Diener, 1984). Life satisfaction can either be global or specific, referring to particular domains of life. Global satisfaction (e.g., 'my life is going well') has been defined as a judgement of one's life as a whole. Domain-specific life satisfaction includes satisfaction with one's family (e.g., 'my parents treat me fairly'), friends (e.g., 'my friends will help me if I need it'), school (e.g., 'I learn a lot at school'), living environment (e.g., 'I like where I live'), and self (e.g., 'I am a nice person') (Huebner et al., 1998).

In comparison with specific domains of life satisfaction, global life satisfaction has been studied comprehensively (Lyons & Huebner, 2016; Ng et al., 2015). Further, research evidence shows that school satisfaction, compared with other domains of life satisfaction, has the weakest correlation with global life satisfaction (Huebner et al., 2005). Findings also indicate that school satisfaction is a separate component from global life satisfaction, though they are positively correlated. This research evidence is especially important when the focus of research is to assess students' perception of their school experiences (Jiang et al., 2013). School satisfaction is generally defined as an individual's cognitive assessment of the quality of their school life (Huebner, 1994). Finding school an interesting place to learn and having positive emotions about it are examples of school satisfaction (Liu et al., 2017).

Traditionally, academic success has mainly been based on criteria such as students' scores demonstrated in educational assessment (Jiang et al., 2013). However, educational leaders and professionals should not only pay attention to students' academic outcomes, but also should be concerned about students' experiences in school (Tian et al., 2016). This is especially important as research evidence shows that level of school satisfaction decreases across school grade levels, especially among high school students (Elmore & Huebner, 2010; Okun et al., 1990; Uusitalo-Malmivaara, 2014).

Recent studies have also shown that a high level of school satisfaction is accompanied by a range of better school outcomes. For example, students with higher school satisfaction are more likely to have higher academic achievement (Huebner & Gilman, 2006; Hui & Sun, 2010; Suldo et al., 2008; Uusitalo-Malmivaara, 2014), more internal locus of control (Huebner et al., 2001; Huebner & Gilman, 2006), fewer school behaviour problems (Suldo et al., 2008), better teacher-student relationship (Jiang et al., 2013; Whitley et al., 2012), greater teacher and peer support (Jiang et al., 2013; Hui & Sun, 2010; Zullig et al., 2018), and higher self-esteem and positive peer relationships in the classroom (Hui & Sun, 2010; Liu et al., 2017; Tian et al., 2016; Whitley et al., 2012). By contrast, those students who dislike school and are dissatisfied with their school have long been identified as more likely to 'drop out' (U.S. Department of Education, 1999), and experience higher psychological distress and less positive social-emotional functioning (Huebner & Gilman, 2006).

Although many studies have reported that most students (8 years old and above) experience positive levels of global life satisfaction and domain-specific life satisfaction across national contexts (Huebner et al., 2000; Huebner et al., 2005; Long et al., 2012), a significant number of students has been reported as dissatisfied with school. For example, in a large-scale study in South Carolina US, middle school students' perceptions of quality of life were investigated (Huebner et al., 2005). Students were asked to rate the level of their satisfaction with school, family, self, living environment, and friends. The response options were ‘terrible’, ‘unhappy’, ‘mostly dissatisfied’, ‘mixed (equally satisfied and dissatisfied)’, ‘mostly satisfied’, ‘pleased’, and ‘delighted’. Many students were mostly satisfied with school; however, approximately 21% of students reported dissatisfaction with their school experiences. In addition, nearly 9% of students described school as terrible (Huebner et al., 2005). In a study by Long et al. (2012), the extent of dissatisfaction with school was even higher (35%). As such, in this research study, school satisfaction in relation to academic achievement for secondary school students with and without disabilities was examined.

2.2.3.1. School Satisfaction and Academic Achievement

Currently, schools use assessment outcomes to determine students’ academic success, and place less emphasis on subjective indicators such as school satisfaction (Baker & Maupin, 2009). Furthermore, objective measures may not reflect accurately the extent to which students have satisfaction with their school experiences. For example, as Epstein and McPartland (1976) stated, ‘high grades alone are not enough to make school experiences satisfying’ (p. 20).

Many studies have examined relationships between global life satisfaction and academic achievement. Findings showed that global life satisfaction is positively correlated with academic achievement, and that this association is reciprocal (Lyons & Huebner, 2016; Ng et al., 2015). However, school satisfaction is often studied in the social and emotional contexts of students’ relationships at school, such as teacher-child and peer-child relationships. To date, there have been few studies investigating the relationship between school satisfaction and academic abilities. In the few existing studies, school satisfaction is found to be an important outcome of academic achievement (Huebner & Gilman, 2006; Hui & Sun, 2010; Suldo et al, 2008). For example, in a study of 321 high school students in the US, Suldo et al. (2008) found that students' personal academic beliefs, assessed by the School Attitude Assessment Survey-Revised (McCoach & Siegle, 2003), mediated the association between academic achievement (school-reported grade point average) and school satisfaction.

In a Chinese study, the relationship between intrapersonal factors (self-esteem and hope), school contextual factors (teacher support, peer support, and academic performance) and school satisfaction in a sample of primary school children was investigated (Hui & Sun, 2010). The school satisfaction subscale of the Multidimensional Life Satisfaction Scale for Children (Huebner, 1994) was used. To assess students' academic achievement, students were asked to rate whether they did well in the subjects of Chinese, English and Mathematics, as well as their overall academic performance, on a four-point scale. Findings revealed that teacher support was the most significant predictor of satisfaction with school, followed by academic achievement. Furthermore, self-esteem and hope were significant correlates of school satisfaction in their study.

Finally, the role of school-related correlates and life satisfaction of 881 high school students was examined in another study undertaken in Hungary (Piko & Hamvai, 2010). The Satisfaction with Life Scale (Diener et al., 1985, cited in Piko & Hamvai, 2010) and a self-report of academic achievement were used, and the research findings showed that being happy with school and having strong academic achievement predicted adolescents' global life satisfaction (Piko & Hamvai, 2010). In summary, based on a variety of academic achievement measures, studies have shown that school satisfaction linked to academic achievement and therefore academic success may be a determinant in student school satisfaction.

2.2.3.2. School Satisfaction of Students with and without Disabilities

Students' cognitive abilities or intelligence might not influence their appraisal of different aspects of their lives (Baker & Maupin, 2009). Most studies have shown that there is no difference in global life satisfaction between students with and without disabilities (Awasthi et al., 2016; Griffin & Huebner, 2000; McCullough & Huebner, 2003) but differences between these groups have been found in particular dimensions of life satisfaction, especially in school satisfaction (Awasthi et al., 2016; Brantley et al., 2002; Griffin & Huebner, 2000). A growing body of research has employed student's self-report surveys to assess school satisfaction in different school placements and grade levels from various cultures. To obtain a better understanding of research on the level of school satisfaction among students with and without disabilities, research findings are summarised in three groups, discussed below.

In the first group of research studies, findings showed *a lower level of school satisfaction for students with disabilities than students without disabilities* (Arciuli et al., 2019; Arciuli & Emerson, 2020; Coudronnière et al., 2018; Gallagher et al., 2020; McCoy & Banks, 2012). For example, in a longitudinal study conducted by Arciuli and Emerson (2020) in the UK, school satisfaction of students with disabilities was compared with that of students without disabilities at ages 11 and 14. Findings revealed that students without disabilities demonstrated a higher level of school satisfaction compared with students with disabilities. These researchers also found that gender mediated the association between low school satisfaction and disability status, and girls with disabilities expressed the lowest level of school satisfaction.

The second group of studies has shown that *students with disabilities have reported higher levels of school satisfaction than students without disabilities* (Awasthi et al., 2016; Brantley et al., 2002). For example, school satisfaction of students with physical disabilities and students without disabilities was compared (Awasthi et al., 2016). Students with disabilities (n = 73) and students without disabilities (n = 73) aged between 15 and 24 years were recruited from mainstream schools and universities in India. Students were assessed by the Multidimensional Student's Life Satisfaction Scale (Huebner, 1994). No difference was found in specific-domain life satisfaction except for school satisfaction between students with and without disabilities. Students with disabilities expressed a higher level of school satisfaction than students without disability. These researchers argued that, on the one hand, access to equal educational opportunities may empower students with disabilities to do various academic tasks. On the other hand, successful adaptation to educational environments enabled such students to manage their learning challenges and therefore they were satisfied with different domains of life, especially school experiences (Awasthi et al., 2016).

In another study, life satisfaction among 160 high school students with and without mild mental disabilities was investigated and compared using the Multidimensional Student's Life Satisfaction Scale (Huebner, 1994) in South Carolina and Georgia (Brantley et al., 2002). The findings revealed that students with mild mental disabilities indicated higher school satisfaction and lower friends' satisfaction than their peers without disabilities. However, there was no significant difference concerning global life satisfaction between students with and without disabilities. These researchers also found that the school satisfaction of students with mild mental disabilities who were in a self-contained special classroom was higher than that of their peers with similar disabilities who spent three or more hours in a regular classroom. Self-contained classrooms are those that are specifically designated for students with disabilities and often involve students with multiple and intensive support needs which usually do not allow the students to participate in regular classrooms.

Although Brantley et al.'s (2002) findings showed that students with disabilities in special classrooms had higher satisfaction with their school than their peers with disabilities in regular classrooms, the opposite was found in a study conducted in Finland (Uusitalo-Malmivaara et al., 2012). In this study, school happiness and subjective happiness among 152 students with disabilities (learning disabilities and behavioural problems) aged between 11 and 16 years were studied. Seventy-five students attended special education schools and 77 students attended mainstream schools but in special education classes. Students completed the Subjective Happiness Scale (Lyubomirsky & Lepper, 1999) and the School Children's Happiness Inventory (Ivens, 2007). Results indicated that students in special education classes in mainstream schools were subjectively happier than students in special education schools, with boys happier than girls in this group, while no gender difference was found among students in the special schools.

The third group of studies *has not found significant differences in school satisfaction between students with and without disabilities* (Gilman et al., 2004; McCullough & Huebner, 2003). For instance, life satisfaction among 160 high school students with and without learning disabilities in the US was investigated using the Multidimensional Student's Life Satisfaction Scale (Huebner, 1994). Results from the study showed that there were no significant differences between students with learning disabilities and their typically achieving peers regarding their global life and school satisfaction. Both groups reported positive levels of life satisfaction (McCullough & Huebner, 2003).

Similarly, different dimensions of life satisfaction among 159 students with hearing impairment and students without disabilities aged between 8 and 18 years were examined using the Multidimensional Student's Life Satisfaction Scale (Huebner, 1994). Results showed that there was no significant difference regarding school satisfaction between deaf/hard of hearing students and their peers. However, students without disabilities indicated higher global life satisfaction compared with students with hearing impairment (Gilman et al., 2004).

In Huebner's (1994) study which also employed the Multidimensional Students' Life Satisfaction scale, the focus was on students with emotional disturbance. Findings revealed that global life satisfaction was positively correlated with school satisfaction for students with emotional disturbance, but not for regular education students. A later study (Griffin & Huebner, 2000) failed to find a significant difference regarding global life satisfaction and school satisfaction among students with and without emotional disturbance.

In summary, although many studies have shown that the global satisfaction of students with disabilities is not lower than that of students without disabilities, findings are mixed in the domain of school satisfaction. These studies have provided support for the validity and reliability of the Multidimensional Student's Life Satisfaction Scale (Huebner, 1994) frequently used for different groups of students with disabilities from elementary to high school.

2.3. Chapter Summary

This chapter reviewed the literature on the conceptualisation of adjustments and presented previous studies' findings in relation to the effectiveness of educational adjustments on academic achievement. The central focus of most studies was on using standardised external tests to measure students' academic achievement with and without disabilities under adjusted and non-adjusted situations and to investigate the validity of testing adjustments. Different findings were obtained from the effectiveness of testing adjustments on academic achievement.

Despite close attention given to the provision of testing adjustments for students with disabilities, no qualitative or quantitative research study was found to investigate the effectiveness of classroom adjusted assessment on students' classroom grades of students with disabilities in mainstream schools. In Australia, students with disabilities should be able to access and participate in classroom assessments 'on the same basis' as students without disabilities (DSE, 2005). However, it remains unclear how assessments are being exactly adjusted inside mainstream classrooms, and whether the implemented adjustments, through removing or reducing barriers relating to disabilities, improve the academic achievement of students with disabilities. This research gap is investigated in this study.

The importance of students' academic wellbeing, both in school and beyond, has long been recognised in published studies. As the Review of Literature has shown, academic achievement and academic self-concept are related for students without disabilities. However, results are varied as to how students with disabilities perceive their academic capabilities and take responsibility for success and failure. Also, despite considerable focus on education in the middle years, very few studies addressed academic achievement in relation to school satisfaction for students with and without disabilities, and the findings have been mixed for both groups. Therefore, a research study is needed to add to the body of knowledge that examines these relationships.

Additionally, students with disabilities face a range of academic and socio-emotional challenges in mainstream classrooms, and the purpose of educational adjustments is to address these challenges. However, the question arises about how assessment adjustments help improve the academic achievement and the academic wellbeing of this group of students. To date, no research study has been found that investigates academic achievement in relation to academic wellbeing for students with disabilities when they receive classroom assessment adjustments in response to their functional impairment in access skills of assessment. In this study, this research gap is explored. From a theoretical perspective, most studies conducted relating to inclusive education have focused on the social model of disability. This study takes a biopsychosocial approach to investigate how the interactions between health conditions, student impairments, psychosocial features, and educational barriers affect the capabilities of a student with disabilities to demonstrate their knowledge and skills. The following chapter discusses the methodology used to build on the research literature considered in this review and to address the key questions of provision of assessment adjustments, achievement and the academic wellbeing of students with disability in the Australian inclusive education context.

CHAPTER 3: Methodology

3.0. Overview

This mixed methods study[4] aimed to examine the relationship between academic achievement and academic wellbeing for Australian secondary school students with and without disabilities and to reach an in-depth understanding of how academic achievement of students with disabilities relates to classroom assessment adjustments, as required by Australian legislation, and their academic wellbeing. Academic wellbeing has been conceptualised in this study as comprised of academic self-concept, academic responsibility, and school satisfaction. In response to the research gaps identified in the Review of Literature, the following specific questions were addressed:

Research Question 1: What is the relationship between academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) for Australian secondary students with and without disabilities?

Research Question 2: Are there differences in academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) between secondary students with and without disabilities?

[4] . As noted, this research study was an extension of the Australian Research Council Discovery Project DP150101679 *Effective Teacher-Based Assessment Adjustments for Secondary Students with Disability* (Adjustments in Classroom Assessment Project [ACAP]).

Research Question 3: Are there differences in academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) across the NCCD levels of implemented adjustments for secondary students with disabilities?

Research Question 4: How does academic achievement relate to selected adjustments to classroom assessment for secondary students with disabilities?

Research Question 5: How does academic achievement under adjusted conditions relate to academic wellbeing (academic self-concept, academic responsibility, school satisfaction) of secondary students with disabilities?

This chapter is organised into five sections. First, mixed methods research design and mixed methods sampling strategy are described. In the second section, three stages of conducting the study's quantitative strand (participant selection, instruments and data analysis procedures) are presented. The third section of this chapter includes an overview of qualitative case study research, qualitative sampling, participant selection, instruments, and qualitative data analysis procedures. Ethical considerations are discussed in the fourth section. Finally, in the fifth section, the chapter summary is provided.

3.1. Research Methodology: Mixed Methods Research

Mixed methods research was used in this study to address the research questions and investigate how academic achievement and academic wellbeing were related for students with and without disabilities. In mixed methods research, 'the investigator collects and analyses data, integrates the findings and draws inferences using both qualitative and quantitative approaches in a single study' (Tashakkori & Creswell, 2007, p. 4). This research approach is adopted when one type of study cannot sufficiently address a research problem, and more in-depth quantitative and qualitative data are required to answer the research questions (Creswell & Guetterman, 2021). Although quantitative and qualitative approaches may present different ways to see and understand a phenomenon, Creswell and Creswell (2018) stated that they should not be considered as two distinct categories, but as different ends on a continuum. Creswell and Creswell (2018) noted mixed methods research is placed in the middle of this continuum. As a result, implementation of mixed methods does not reduce the value of either quantitative or qualitative components of research but gathers the strengths of the two methods to minimise any weaknesses that may result from conducting one study alone (Johnson & Onwuegbuzie, 2004).

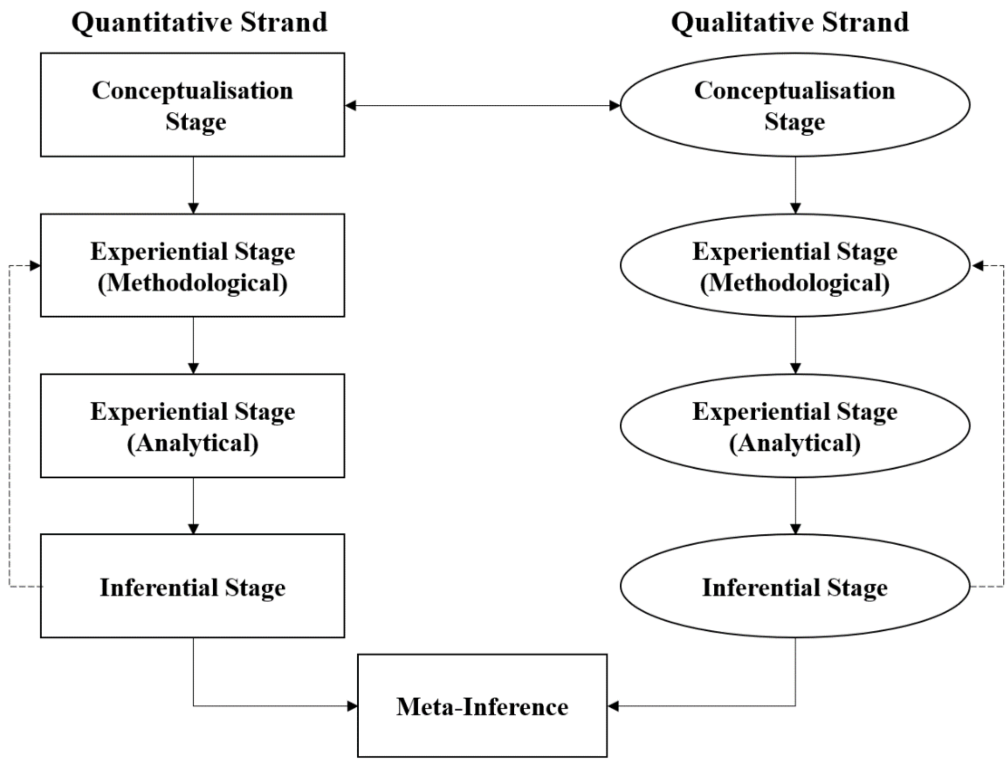
Mixed methods research design requires 'creativity and flexibility' in construction to integrate both quantitative and qualitative approaches (Teddlie & Tashakkori, 2009, p. 61). The framework of this research study was based on Teddlie and Tashakkori's (2009) model of the research process. According to this model, each strand of the research study, where a strand is a phase of mixed methods research in which one research approach is utilised (Collins et al., 2012), comprises three stages: conceptualisation, experiential stage (methodological/analytical), and inferential stages (Teddlie & Tashakkori, 2009) (see Figure 3.1).

The conceptualisation stage includes identification of research problems, aims of the study, and research questions. In the experiential stage, a research design is identified and then data are gathered and analysed. The stage of inference includes the process of interpreting research results, with conclusions derived from the outcomes of interpretation (Teddlie & Tashakkori, 2009). Further, the quantitative and qualitative inferences made might raise additional research question(s) to investigate fully the phenomenon of interest. Overall, the quantitative and qualitative strands are employed to respond to related aspects of the same overarching mixed research question(s). At the end of the study, inferences from both the qualitative and qualitative strands are integrated to shape a meta-inference (Teddlie & Tashakkori, 2009). It is important to highlight that the term *integration* in mixed methods research does not necessarily mean reaching a single understanding on the basis of the findings. This term denotes drawing reasonable conclusions on the basis of the results of both strands (Tashakkori & Newman, 2010).

Different typologies of mixed methods research designs are based on *implementation* processes and include parallel, sequential, conversion, multilevel, and fully integrated designs (Teddlie & Tashakkori, 2009). In sequential designs, one strand of the study is developed based on findings from an earlier strand and may or may not involve the same participants. In a parallel mixed design, each strand is conceptualised at the same time with separate research designs, procedures for data collection and analysis, and inference. A parallel mixed design was used for data collection and data analysis in this research study. A parallel design may also gather data at different times due to practical considerations, as occurred in this study. Inferences drawn from each strand's results are combined or synthesised to make meta-inferences at the end of the study (Teddlie & Tashakkori, 2009). In this study, Figure 3.1 shows a visual illustration of this parallel mixed research design.

Figure 3.1

Depiction of the Parallel Mixed Research Design.



Note. Adapted from 'Foundation of Mixed Methods Research: Integrating Quantitative and Qualitative Approaches in the Social and Behavioral Sciences' by C. Teddlie and A. Tashakkori, 2009, p. 152. Copyright 2009

3.1.1. Rationale for Mixed Methods Research

To date, research with students with disabilities on academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) has predominantly been undertaken through quantitative studies emanating from the US and countries other than Australia. As the Review of Literature has shown, results are mixed as to how students with disabilities perceive their academic abilities and school experience and take responsibility for their academic success and failures. To explore these in the Australian context, the first strand of this mixed method study was designed to investigate whether findings from previous research for students with disabilities regarding academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) were transferable to an Australian secondary schooling context, and, further, compare the variables of interest across the level of adjustments provided by teachers. Therefore, a quantitative study was designed. For this strand, data on adjustments were obtained through the system-level data available from schools, that is, Nationally Consistent Collection of Data (NCCD) for students with disabilities, allowing analyses of NCCD level of adjustments being provided in their schooling. To obtain a more nuanced understanding of how academic achievement of students with disabilities relates to classroom assessment adjustments and their academic wellbeing, a qualitative strand was designed. Hence, mixed methods research was utilised to enable meaningful understanding of relationships between academic achievement and academic wellbeing and classroom assessment adjustments for students with disabilities, which would be limited using either approach alone.

3.1.2. Mixed Methods Research Sampling: Overview

Limited literature has been published about mixed methods sampling strategies (Collins et al., 2007; Teddlie & Yu, 2007). Onwuegbuzie and Collins (2007) developed a sampling model as a function of two dimensions: (a) the time orientation of the quantitative and qualitative components (concurrent vs. sequential) and (b) the relationship of qualitative and quantitative samples. Time orientation refers to whether quantitative and qualitative strands of mixed methods research occur at approximately the same time or are organised into phases over time. The relationship of qualitative and quantitative samples, according to Onwuegbuzie and Collins (2007), can be organised in four categories: identical, parallel, nested, and multilevel. Identical and parallel relationships are more common types of relationships of samples. In an identical relationship, the same participants are involved in both strands. In a parallel relationship, participants in the quantitative and qualitative strands are different but are selected from the same population characteristics (e.g., age group). For example, in the quantitative strand, secondary school students are selected from school A. However, in the qualitative strand, the secondary school students are chosen from school B (Teddlie & Tashakkori, 2009). Therefore, data are gathered from independent participants.

A parallel mixed sampling strategy was used in this research study. In this type of sampling, probability and purposive sampling procedures are used to separately address quantitative and qualitative research questions (Teddlie & Tashakkori, 2009). In the quantitative strand of the study, two-stage cluster sampling was used to select secondary school students with and without disabilities (Creswell & Creswell, 2018). After identifying the participating schools, in the first stage, classrooms were randomly selected by school facilitators. In the second stage, all students of the selected classrooms who agreed to participate/consent (students and their parents) were involved in data collection. These stages are described further below. In the qualitative strand of the study, purposeful sampling was used to identify four case study students with disabilities. Purposeful sampling 'is based on the assumption that the investigator wants to discover, understand, and gain insight and therefore must select a sample from which the most can be learned' (Merriam, 2009, p.77). Therefore, a parallel mixed sampling strategy was well-suited for the purpose of this study.

3.1.3. Mixed Methods Research Data Collection: Overview

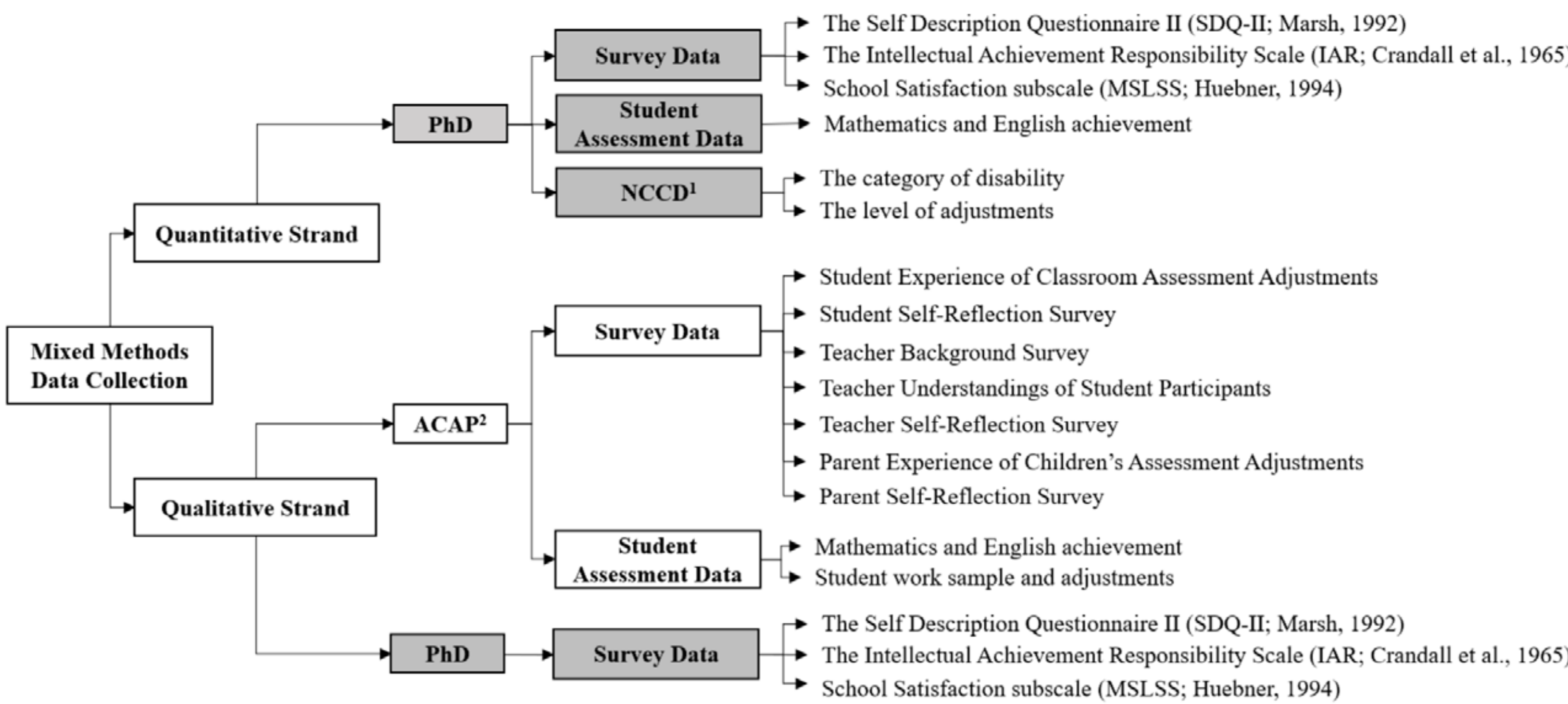
Mixed methods data collection refers to the collection of both quantitative and qualitative data in a single study (Teddlie & Tashakkori, 2009). Two basic strategies can be used to gather mixed methods data: within-strategy and between-strategies. Within-strategy refers to using the same strategy (e.g., questionnaires) to gather data in both the quantitative and qualitative strands of the study. Between-strategies refers to using two or more strategies (e.g., observations, interview, and focus group) to collect data in the quantitative and qualitative strands. In this research study, a questionnaire-centred strategy was used with additional data addressing the research questions sourced from participants and schools.

As detailed in the following sections, in the quantitative strand of the study, secondary school students with and without disabilities in Years 7 to 9 completed the Academic Wellbeing Questionnaire comprised of three scales, the Self Description Questionnaire II, the Intellectual Achievement Responsibility Scale and School Satisfaction subscale. Students' classroom assessment grades in English and Mathematics were used to assess students' academic achievement. The Nationally Consistent Collection of Data (NCCD) information recorded by schools for the participating students was used to identify students with disabilities, the category of disabilities, and the level of implemented adjustments for this study.

In the qualitative strand of the study, data were obtained from two data sources. First, I used existing data for the four case study students obtained in the ACAP study. The ACAP database consists of two components: *Survey Data* (student, parent, teacher); and *Student Assessment Data* (Mathematics and English grades, and artefacts related to adjusted assessment tasks for the students). All ACAP data were collected online. Further, the four case study students completed online the same questionnaire and three scales (the Self Description Questionnaire II, the Intellectual Achievement Responsibility Scale, School Satisfaction) that was used in the quantitative strand. As previously noted, for practical reasons, participants within each strand of this study were selected independently at different times. A summary of stages of collecting mixed methods data for the current research study is shown in Figure 3.2. The highlighted data in the figure were original data collected specifically for this doctoral research.

Figure 3. 2

A Summary of Stages of the Mixed Methods Data Collection



3.2. Strand 1: A Quantitative Study

Strand 1 of this research study was undertaken to examine the relationship between academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) for secondary students with and without disabilities. Moreover, this research study was conducted to compare the academic achievement of students with disabilities and their academic wellbeing with respect to the level of adjustments provided within the classroom, as identified through the NCCD. A comparative and correlational design was used. This strand of the research study addressed three aims and questions:

Aim 1: The first aim was to investigate the association between academic achievement, academic self-concept, academic responsibility, and school satisfaction for secondary students with and without disabilities. Therefore, the following research question was examined:

Research Question 1: What is the relationship between academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) for secondary students with and without disabilities?

Aim 2: The second aim of this strand of the study was to investigate differences between secondary students with and without disabilities in academic achievement, academic self-concept, academic responsibility, and school satisfaction. For this aim, the research question was:

Research Question 2: Are there differences in academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) between secondary students with and without disabilities?

Aim 3: The third aim in this strand was to compare academic achievement and academic self-concept, academic responsibility, and school satisfaction across the NCCD level of implemented adjustments for secondary students with disabilities. As such, the following research question was examined:

Research Question 3: Are there differences in academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) across the NCCD levels of implemented adjustments for secondary students with disabilities?

3.2.1. Participants

A total of 122 students (69 girls (56.6%) and 53 boys (43.4%); *M* (age) = 13, *SD* = .78) in Years 7 to 9 participated in this study. The participants consisted of 42 students with disabilities and 80 students without disabilities who were recruited from independent and state secondary schools in Queensland (n = 109) and Victoria (n = 13), Australia. Thirteen students with disabilities of the 122 students who had participated in the ACAP study, but who were not identified as the case study students in Strand 2 of this study, were included in Strand 1 of this study. However, the NCCD data for these students had not been provided in the ACAP study. Of 122 students, 22 students (18.02%) were identified as having medical conditions[5]. Eight students who were reported by their school to have medical conditions, were not identified by the school as having a disability and were therefore in the group of students without disabilities. Descriptive statistics for students with and without disabilities are presented in Table 3.1.

[5] . In the NCCD data provided by schools, information relating to the participating students' medical conditions had also been reported.

Table 3. 1

Descriptive Statistics for Students with and without Disabilities

Ability Status	Sex		N (%)	Year Level			Medical conditions
	Female	Male		7	8	9	
Students with disabilities	14	28	42 (34.42%)	21	15	6	14 (11.47%)
Students without disabilities	55	25	80 (65.57%)	36	40	4	8 (6.55%)
Total	69	53	122 (100%)	57	55	10	22 (18.02%)

All participating students with disabilities attended mainstream schools. The NCCD information recorded by schools was used to identify the category of student disabilities and the level of adjustments made. As can be seen in Table 3.2, 65.5% of the students for whom NCCD data were provided fell into the category of cognitive disabilities. Most participating students with disabilities (44.8%) were reported to receive the supplementary level of adjustments.

Table 3.2

Descriptive Statistics for Students with Disabilities Based on the NCCD Category of Disability and the Level of Implemented Adjustments

Sex	Category of disability			Level of adjustments		
	Cognitive	Socio-emotional	Physical	QDTP	Supplementary	Substantial
Female	6	5	-	6	5	-
Male	13	3	2	4	8	6
Total	19(65.51%)	8(27.58%)	2(6.89%)	10(34.48%)	13(44.82%)	6(20.68%)

Note. Quality Differentiated Teaching Practice (QDTP)

3.2.2. Quantitative Data Collection

After obtaining ethics approval from the Human Research Ethics Committee at Australian Catholic University (ACU), the Department of Education in Queensland, and the Department of Education and Training in Victoria, data collection was initiated (see Appendix A). School facilitators and school principals from schools who had originally participated in the ACAP were initially contacted via telephone to participate in this research study. Principals who agreed to their school's further participation were provided with all information letters (see Appendix B) and consent forms (see Appendix C).

As the focus of this research study was on students both with and without disabilities, school principals were asked to nominate teachers in two or more classrooms with students both with and without disabilities. Teachers who agreed to participate in the study were asked to distribute and collect information letters and Consent Forms for all students within their classes. Students were given Parent Information Letters and Consent Forms to take home requesting parental permission for their children's participation in this study. Students were given Student Information Letters and Consent Forms when their parents' signed consent forms were received. Parent and Student Information Letters included a brief explanation of the main purpose of the study as well as possible risks and benefits of participating in this study.

Although only data for students and their parents who returned signed consent forms were used in this study, participating teachers were asked to administer the questionnaire in each classroom with all students. Such administration was both practical and avoided potential discrimination by identifying any students in the classes as having a disability. Based on trial administration, an initial experience with a school in Queensland, a paper-based questionnaire was found to prefer as the least intrusive for teachers' and students' time. The questionnaire could also be completed online, if schools and teachers preferred. Both paper-and-pencil and online surveys were available to students.

School principals were asked to provide participating students' most recent English and mathematics classroom assessment grades, and information, if recorded, on NCCD, as discussed in Chapter 2, for the students with disabilities who completed the questionnaire. The NCCD information not only enabled the researcher to identify students with disabilities for this study but also provided information on the NCCD level of adjustments implemented within the classroom.

3.2.2.1. Survey Data

All participating students completed a brief survey to provide information on their year level, gender, and age. All students completed the Academic Wellbeing Questionnaire comprised of the three research scales: (i) the Self Description Questionnaire II; (ii) the Intellectual Achievement Responsibility Scale; and (iii) the subscale of School Satisfaction (see Appendix D). The three scales were combined into one questionnaire to simplify administration. Some items of the scales were slightly modified to enhance language specificity and relevance for students with disabilities (e.g., the statement 'I enjoy doing maths' replaced 'I enjoy studying for mathematics'). The three scales are discussed in the following section.

(i) The Self Description Questionnaire II (SDQ-II; Marsh, 1992). This questionnaire was developed from the Shavelson et al. (1976) model to measure multiple dimensions of self-concept for adolescents attending secondary schools in Years 7 to 10. The SDQ-II contains 102 items that assess self-concept in 11 areas, including eight non-academic areas and three academic domains (Mathematics, Verbal/English, and General School). For this study, the three academic subscales were used. *Mathematics Self-concept* addresses students' perception of their mathematical capabilities in mathematics activities (e.g. 'I do badly in tests of mathematics'). *Verbal Self-concept* addresses students' perception of their verbal abilities in verbal tasks (e.g., 'work in English classes is easy for me'). *General School Self-concept* addresses students' perception of their ability and interest in school in general (e.g. 'people come to me for help in most school subjects'). Each academic subscale consists of 10 items measured by a six-point Likert, ranging from 1 = false to 6 = true. The minimum and maximum score for each subscale was 10 and 60, respectively. Half of the items were negatively worded and reverse scored to eliminate response biases (e.g., 'I get bad marks in most school subjects'). The questionnaire took students approximately 15 to 20 minutes to complete.

The SDQ-II has been used widely in research studies (Marsh et al., 2005; McCauley et al., 2018). Internal consistency measured by a Cronbach alpha in previous research has ranged from .85 to .90 for scores on all subscales (Marsh, 1992). In this research study, Cronbach's alpha was α = .95 in Mathematics Self-concept, α = .85 in English Self-concept and α = .92 in General School Self-concept, demonstrating strong internal consistency for a scale with relatively few items.

(ii) The Intellectual Achievement Responsibility Scale (IAR; Crandall et al., 1965). The IAR scale has been developed for students in Years 3 to 12 to measure students' internal responsibility for their academic success and failure. This questionnaire has been widely used in educational studies (Coyer et al., 2004; Middleton, 2017; Shogren et al., 2010). It has also been adapted for Australian students (Manning & Rowe, 1976). The questionnaire is composed of 34 items that describe intellectual-academic achievement situations that lead to academic success (17 items) or failure (17 items). Each intellectual-academic situation has two alternatives. In these alternative situations, either the event is the result of a student's action or the event is caused by some external factor. For example, students are asked 'if you did better than usual in a subject at school, it would probably happen because a) you tried harder or b) someone helped you'. The student received 0 for selecting an external factor and a score of 1 for choosing an internal factor for success and failure. Three separate scores are generated for beliefs in internal academic responsibility for success, and failure, and a total score. Some items have negative wordings such as 'I do badly on tests that need a lot of reading'. These are balanced with positive items.

In this research study, the number of repeated and negative statements was reduced to suit the needs of reading comprehension and attention capacity of some students with disabilities. As a result, fourteen items of this questionnaire were used. The questionnaire took students approximately 15 to 20 minutes to complete. Internal consistency (Spearman-Brown Formula) for the full scale and subscales has been calculated as .53 for academic success (IAR+), .69 for academic failure (IAR-), and .77 for total score (I score) (Manning & Rowe, 1976). In this research study, Cronbach's alpha was $\alpha = .15$ and $\alpha = .49$ for academic internal success and failure respectively. The low reliability for internal success is addressed in the findings in Chapters 4 and 5.

(iii) School Satisfaction (Huebner, 1994). The Multidimensional Student's Life Satisfaction Scale (MSLSS) is a 40-item self-report questionnaire designed to assess children's and adolescents' general life satisfaction and satisfaction in five specific domains (family, friends, school, living environment, and self) from Years 3 to 12. The MSLSS has also been found to have good reliability for students with mild mental disabilities ($\alpha = .83$; Brantley et al., 2002), and students with learning disabilities ($\alpha = .87$; McCullough & Huebner, 2003).

Only the subscale of *School Satisfaction* was used for this study. The School Satisfaction subscale consists of eight statements (e.g., 'There are many things about school I don't like'). Students are asked to rate their satisfaction with school using a six-option Likert scale (1 = strongly disagree to 6 = strongly agree). Three statements are negatively worded and are reverse scored. One score is generated from the school satisfaction subscale. The minimum and maximum score for this subscale was 8 and 48, respectively. A higher score shows higher levels of School Satisfaction. The reliability for the School Satisfaction subscale has been shown to be high ($\alpha = .84$) (Gilman et al., 2004). In this research study, Cronbach's alpha was $\alpha = .92$. This subscale took students approximately 10 minutes to complete.

3.2.2.2. Student Assessment Data

Academic achievement: To assess students' academic achievement, school principals were asked, with the permission of students and their parents, to provide the most recent English and Mathematics summative classroom assessment grades for the participating students. According to the Queensland Curriculum and Assessment Authority (QCAA, 2020), students' achievement is reported from A (the highest level) to E (the lowest level) based on their knowledge and application of skills, and a C grade is the expected achievement standard, representing a sound level of knowledge and understanding of the content, and application of skills. In Queensland, the Australian Curriculum is taught under Year levels, with teachers expected to provide instruction appropriate to a student's level of learning. In Victoria, the curriculum F–10 is 'structured as a continuum across levels of learning achievement not years of schooling'. This structure is to enable 'development of targeted learning programs for all students, where the curriculum is used to plan in relation to the actual learning level of each student rather than their assumed level of learning based on age' (Victorian Curriculum and Assessment Authority [VCAA], 2020). To analyse students' academic achievement, letter grades of A, B, C, D and E were converted to numerical scores of 5, 4, 3, 2, and 1 respectively.

3.2.2.3 Adjustments to Classroom Assessment

As discussed in Chapter 2, there is little information on the type of adjustments provided to students with disabilities in the classroom. School principals were asked to provide information, if recorded, on the NCCD for students who had agreed to participate in the data collection and had completed the questionnaires. This information included the category of students' disabilities (physical, cognitive, sensory, and social/emotional) and the level of adjustments provided to them based on identified needs (4 = extensive, 3 = substantial, 2 = supplementary, and 1 = support within quality differentiated teaching practice). In this study, only the NCCD level of adjustments was used to examine Research Question 3.

3.2.3. Quantitative Data Analysis

IBM SPSS Statistics Version 25 was used for statistical analysis. An assessment of normality of data was conducted (see Table 4.3, Chapter 4). Given that outcomes for variables of interest (academic self-concept, academic responsibility, school satisfaction) were normally distributed, parametric statistical techniques were undertaken to analyse data. Pearson's correlation coefficients were calculated to examine the relationship between Mathematics and English Achievement and academic wellbeing components (RQ1). Values for Pearson's correlation coefficient (r) range between 1 and -1. Kendall's Tau was also calculated for the relationship between disability status (a binary variable) and the variables of interest. Mean scores (total score per scale divided by number of scale items) were used in analyses for the Academic Wellbeing Questionnaire for the three research scales: (i) the Self Description Questionnaire II; (ii) the Intellectual Achievement Responsibility Scale; and (iii) School Satisfaction subscale.

To examine whether there was a statistical difference between the mean scores of students with and without disabilities in academic achievement and academic wellbeing (RQ2), an independent-sample t-test was conducted. Finally, a one-way ANOVA was used to determine whether there were any statistically significant differences between academic achievement and academic wellbeing across the NCCD levels of quality differentiated teaching practice, supplementary and substantial adjustments (RQ3), for students for whom NCCD data had been provided.

3.3. Strand 2: A Qualitative Study

Strand 2 of the study was designed to give students with disabilities a voice about their real experiences with classroom assessment adjustments. As such, the purpose of this strand was to gain an in-depth understanding of how academic achievement of students with disabilities related to classroom assessment adjustments. Further, the academic achievement of students with disabilities in the adjusted conditions in relation to their academic wellbeing was investigated. Thus, the following research questions were addressed:

Research Question 4: How does academic achievement relate to selected adjustments to classroom assessment for secondary students with disabilities?

Research Question 5: How does academic achievement under adjusted conditions relate to academic wellbeing (academic self-concept, academic responsibility, school satisfaction) of secondary students with disabilities?

3.3.1. Qualitative Case Study Research: Overview

Case studies are one of the most common types of qualitative research, widely used in education, social and behavioural sciences (Stake, 2010). Stake (1995) views a case as an entity of interest that we want to understand. Merriam (1988, p. 21) defines a qualitative case study as ‘an intensive, holistic description and analysis of a single instance, phenomenon, or social unit’. According to Creswell and Creswell’s (2018) view, ‘a case study is an in-depth exploration of a bounded system based on extensive data collection’. In all perspectives, a case study is seen as a bounded system (Creswell & Creswell, 2018; Stake, 1995; Merriam, 1998; Yin, 2018), in which boundaries are set out by the researcher to make clear descriptions of issues or phenomenon of interest.

The phenomenon should be bounded by certain parameters for example individuals, time, and place. Stake (1995) identified three types of case studies including: the intrinsic case, the instrumental case, and the collective case. An intrinsic case study is undertaken to gain in-depth understanding of a particular case; an instrumental case study is used to provide insight into the particular issue. In an instrumental case, the case itself is of secondary significance and plays a supportive role by facilitating understanding of something else. A collective case study, also known as a multiple case study (Creswell & Creswell, 2018; Stake, 1995; Yin, 2018), includes several instrumental cases that provide a deeper understanding of the particular issue.

This research study was designed as a collective case study (Stake, 1995) to obtain an in-depth understanding of how academic achievement under adjusted situations is related to academic wellbeing (academic self-concept, academic responsibility, school satisfaction) for students with disabilities. The collective case study enabled exploration of student cases not only as individuals, but also for commonalities and differences across the cases (Stake, 1995).

3.3.2. Qualitative Sampling Method

In this strand of the study, purposeful sampling was used to recruit participants. The logic of purposeful sampling is to select illuminative cases which enable qualitative researchers to study the phenomenon of interest in-depth (Patton, 2015). Maximal variation sampling was used to choose case study students. Maximal variation sampling is a purposeful sampling method in which researchers select a small number of units or cases that show different dimensions of a characteristic (Creswell & Guetterman, 2021). Thus, the participating students were selected from the different groups of disabilities to understand how teachers adjusted the assessment tasks with regard to the learning needs of the students with disabilities. Five criteria were used in this strand to recruit students with disabilities, discussed below:

(i) students were identified as having a disability by the schools
(ii) each student had a specific type of disabilities
(iii) students were in Years 7 to 9
(iv) students were in mainstream classrooms where curriculum content was similar for students both with and without disabilities, but the access mode of curriculum and assessment may be differentiated as required; and
(v) students were studying mathematics, English, and/or humanities and social sciences (HASS; e.g., history and geography).

3.3.3. Participants

As previously noted, this research study was an extension of the ARC Discovery Project Effective Teacher-Based Assessment Adjustments for Secondary Students with Disability (Adjustments in Classroom Assessment Project [ACAP]). The ACAP sample selection is first briefly described below, followed by procedures for selecting case studies for this research study. The ACAP participants comprised 60 students with disabilities in Years 7 to 11, their parents (n = 58, two parents had more than one student) and teachers (n = 45). Participating students and teachers were recruited from 19 secondary schools, across three Australian states (Queensland, New South Wales, Victoria) and education sectors (Independent, state, Catholic) between Terms 2 and 4 (from May to December 2018). Students were identified as having a disability under the DDA definition of disability.

Participating students in the ACAP study were also invited to participate in this doctoral research. Eighteen students agreed to participate in and completed the Academic Wellbeing Questionnaire. Of the 18 students, four students were identified as the case study students based on the study’s inclusion criteria. Twelve participants, including four students with disabilities, their parents (n = 4) and teachers (n = 4) were included in the study. The age of participating students ranged from 12 to 15. All four case study students were boys, albeit student gender was not a criterion for getting involved in this study, as these cases provided the greatest diversity of students’ characteristics, adjustments, and effect on outcomes. According to Australian Bureau of Statistics (ABS; 2018) boys (9.6%) are more likely than girls (5.7%) to be identified as having a disability. Demographic characteristics of participating students in the Strand 2 of the study are shown in Table 3.3.

Table 3. 3

Demographic Characteristics of Participating Students in Strand 2 of the Study

Case study	Year Level	Age Year/ month	Sex	Nature of dominant disability
Alfie	9	14/4	male	specific learning impairment (Dysgraphia)
Liam	8	13/7	male	Autism Spectrum Disorder
Daniel	9	15	male	autism spectrum disorder, ADHD, specific learning impairment, language impairment
Leo	7	12/8	male	specific language impairment, auditory processing disorder

Note. ADHD: Attention Deficit Hyperactivity Disorder

Four teachers (female = 3, male = 1) completed surveys for the ACAP study for these case study students. The teachers were in the age group of 25 to 54. As their highest teaching qualification, three teachers held a Bachelor's degree and one teacher held a post-graduate diploma at the time of the research. Teachers were also diverse in the number of years they had been teaching from under five years to 21 years and over. Overall, the data are not limited to one type of teacher in terms of sex, age or teaching experience. Demographic characteristics of participating teachers are presented in Table 3.4.

Table 3. 4

Participating Teachers' Demographic Characteristics in Strand 2 of the Study

Student's teacher	Gender	Age group	Level of education	Years of teaching	Subject of instruction
Alfie's teacher	female	25-34	Postgraduate diploma	Under 5yrs	Mathematics
Liam's teacher	male	45-54	Bachelor	16-20	Mathematics
Daniel's teacher	female	25-34	Bachelor	6-10	English
Leo's teacher	female	35-44	Bachelor	11-15	English/history

Students and teachers were from three secondary schools (Years 7 to 12) and one combined school (Prep to Year 12) within two states (Qld and Vic). Two schools were from non-government and two from the government sector. The schools were in metropolitan areas. All the focus students attended co-educational schools. According to the Index of Community Socio-Educational Advantage (ICSEA), based on parental occupation and employment (Australian Curriculum, Assessment and Reporting Authority, 2015), most students were from average socio-educational communities (Average ICSEA value = 1000, *SD* = 100). Demographic information for each participating school is presented in Table 3.5.

Table 3. 5

School Demographic Profile in Strand 2 of the Research Study

	Students		Year	School	School	Location	State
	female	male	range	type	sector		
Alfie	40%	60%	7-12	Secondary	G	Metropolitan	QLD
Liam	55%	45%	Prep-12	Combined	N-G	Metropolitan	QLD
Daniel	49%	51%	7-12	Secondary	N-G	Metropolitan	VIC
Leo	49%	51%	7-12	Secondary	G	Metropolitan	QLD

Note. Data were derived from the MySchool Website (https://www.myschool.edu.au/). G = Government; N-G = Non-Government; VIC: Victoria; QLD: Queensland

3.3.4. Qualitative Data Collection

Strand 2 of this study included two stages (ACAP data and PhD data) to gather data. I first used existing collected data for the ACAP study. The ACAP database consisted of two components: *Survey Data* (student, parent, teacher) and *Student Assessment Data* (most recent Mathematics and English classroom assessment grades, student work sample with adjustments). The ACAP surveys for students, parents, and teachers were developed by the ACAP research team. A structured survey and six semi-structured surveys that included open-ended questions were used. The ACAP surveys used in this strand are first described, followed with a description of PhD data collection.

Stage 1: The ACAP Data Collection. Following ethics approval, prospective school principals were contacted directly by the ACAP research team via phone and invited to participate in the study. Once principals provided consent for their school to participate, school facilitators were contacted to nominate teachers who taught in the targeted subject areas (English, mathematics, science, humanities and social sciences) across Years 7 to 11. Teachers who consented to participate were asked to nominate up to three students with disabilities in their classroom, together with their parents, to participate in the study. A copy of Information Letters and Consent Forms for students and their parents was then sent via email by teachers. Only students and parents who returned a signed consent form were eligible to be engaged in the ACAP. Contact with participating teachers, students, and their parents occurred via email. Online research surveys were created using Qualtrics Software (https://www.qualtrics.com), allowing a survey link as well as a personalised ID number to be directly emailed to participating teachers, students, and their parents.

3.3.4.1. Measures

3.3.4.1.1. Student Assessment Data

(i) Adjusted classroom assessment task [ACAP]: To gain a deeper understanding of how assessment tasks were adjusted with regard to specific learning needs of each case student, participating teachers were asked to provide a copy of a work sample that the case study students had recently completed, the students' grade on the task, the related unadjusted assessment task, and the curriculum criteria sheet or grading rubric. Artefacts associated with the student assessment task were scanned and uploaded by teachers to the virtual research environment used for ACAP, identified with teacher and student ACAP ID codes and transferred to teacher/student files. The artefacts offered by all participating teachers showed that the assessment tasks were validated and endorsed by the relevant Heads of Department within each school.

(ii) Academic achievement: The teachers were asked to provide the most recent English and Mathematics grades of the case study students. As noted, in Queensland, student achievement is reported using the Queensland Curriculum Assessment and Reporting Framework Standards (QCAR, 2020) for the case study students' Year levels (A = very high level, B = high level, C = sound level, D = limited level, E = very limited). In Victoria, curriculum F(foundation)–10 is structured as a continuum across six levels (Foundation, Ls 1-2, Ls 3-4, Ls 5-6, Ls 7-8, Ls 9-10) of learning achievement, not years of schooling. This continuum enables the development of targeted learning programs for all students, where the curriculum is used to plan with respect to the identified learning level of each student rather than an assumed level of learning based on age (Victorian Curriculum and Assessment Authority [VCAA], 2020). Results for Victorian case study students are reported by Level.

3.3.4.1.2. Survey Data

(A) ACAP Student Surveys

(i) Student Experience of Classroom Assessment Adjustments: This survey consists of 15 items measured by six closed and nine open-ended questions. Students were asked to provide basic demographic information (e.g., age, year level), a brief description in their own words of their disabilities and the effects of these disabilities on the students' learning process and assessment experiences (e.g., 'please tell us briefly about your individual needs', 'how do your individual needs affect your assessment in class?'). Moreover, students were asked to choose a subject area and demonstrate the extent to which they felt confident to effectively learn and achieve in the selected subject. They were required to describe the adjustments that had been provided to them in the targeted area as well as their effects in relation to the subject assessment (e.g., 'what sorts of adjustments have been made to assessment for you?', 'have these adjustments to assessment helped you do better in this subject?').

(ii) Student Self-Reflection Survey: This survey asked students to reflect upon the last unit of work they completed, and then asked them to describe how the specific assessment adjustments were provided to them for the selected unit of work (e.g., 'How was the assessment adjusted for you?'; 'How was it different to assessment completed by other students?'), and whether the implemented adjustments have met their learning and assessment needs (e.g., 'Do you think this adjustment better allowed you to demonstrate what you knew or could do?'). This survey was comprised of ten open-ended questions.

(B) ACAP Teacher Surveys

(i) Teacher Background Survey: As a preliminary form of data collection, a survey was developed by the ACAP team to collect demographic information from participating teachers. The survey consisted of sixteen items asking questions about teacher age, gender, educational level, years of teaching, teaching qualification, subject(s) area taught and the number of students in class. This survey took approximately ten minutes to complete.

(ii) Teacher Understandings of Student Participants: This survey comprised 8 questions, including five open-ended questions and three closed questions. The survey asked teachers to provide a brief description about the nature of disabilities of the focus students, their effects on the learning and assessment process, and student's strengths that could help in assessment in the target subject. The teachers were asked to describe how they found out about student disabilities, and what adjustments they provided for the focus student in the classroom (e.g., 'what are the adjustments that you are planning for assessing student?). The questionnaire took approximately ten minutes to complete.

(iii) Teacher Self-Reflection Survey: This survey was comprised of three open-ended questions that asked teachers firstly to focus on the target unit of work that they taught, and then to describe issues relating to adjusting assessment for the focus students. Teachers were asked to describe positives and negatives of implemented assessment adjustments. Finally, the questionnaire asked teachers' viewpoints about types of adjustments that they considered would improve the focus student's outcomes in the future. It took teachers approximately ten minutes to complete the survey.

(C) ACAP Parent Surveys

(i) Parent's Experience of Children's Assessment Adjustments: This survey asked parents of students with disabilities to provide a brief description of their child's disabilities and the perceived effects of these disabilities on the process of the student's classroom learning and assessment. Moreover, parents were asked to describe what adjustments could help their student undertake tasks. The survey consisted of three closed questions (e.g., 'do you want to have changes to class assessments to help your child with disability?', 'do you know if any adjustments have been made to your child's assessment?') and six open-ended questions (e.g., 'what sorts of adjustments to assessment have been made for your child?'). This survey took approximately ten minutes to complete.

(ii) Parent Self-Reflection Survey: This survey investigated parents' reflections on the assessment adjustments that had been provided to their children in the completed unit of work. The survey was comprised of six open-ended questions (e.g., 'how was the assessment adjusted to take into consideration your child's individual needs?', 'do you think this adjustment better allowed your child to demonstrate what they knew or could do?', 'what extra help or support does your child receive in order to complete the assessment?') and one closed question (e.g., 'do you know how this unit of work was assessed?'). The survey took approximately ten minutes to complete.

Stage 2: PhD Research Study Data Collection. Parents who had already consented to their children's participation in the ACAP had also indicated whether they agreed to be contacted for this PhD research study. Thus, school e-mail addresses of students and their parents and the student ID numbers were obtained from the ACAP database. Because the ACAP data collection occurred through a virtual research environment and online surveys, this strand was also conducted online to maintain data consistency and student access, using Qualtrics Software to create the online questionnaire. First, the Parent Information Letter and Consent Form were emailed directly to parents of the focus students to invite their children to participate in this research study. Students whose parents agreed to their children's participation were emailed a Student Information Letter and Consent Form. After receiving signed Parent and Student Consent Forms, consenting students were provided with an online survey link and a numerical identifier to complete the questionnaire online. Students were also required to enter their personalised ACAP ID code for de-identification purposes so that the researcher could crossmatch data that were collected in ACAP. The questionnaire could be completed either via mobile phone, tablet or personal computer at any time. To obtain a higher return rate, parents were reminded three times via email to ask their child to complete the questionnaire.

Parents were also advised they could assist their child to complete the surveys and questionnaires if this was necessary due to the students' disabilities. Evidence on return of the questionnaires for the four case study participants was that, while parents may have assisted students to complete questionnaires, the responses, wording and expression reflected the children's perspectives.

3.3.5. Qualitative Data Analysis

Stake's (1995) multiple or collective case study model of data analysis was used in the qualitative strand of the study. According to Stake's approach, researchers can analyse data concurrently and/or after completion of data collection in qualitative research. Data analysis of the study was initiated when the ACAP data gathering was completed. The two strategies were used to analyse data: within-case and cross-case analysis (Stake, 2006). In the within-case analytical approach, units of meaning are identified to provide a comprehensive description of each case study. Cross-case analysis is a strategy that investigates commonalities and differences in the phenomenon under study across all cases (Stake, 2006). The purpose of within-case analysis in this study was to find out how the participating teachers adjusted the specific assessment tasks (e.g., English, Mathematics, History) with regard to the student's special needs, and how academic achievement related to the provided adjustments. Data analysis using the within-case analytical approach is discussed first, followed by data analysis description through cross-case comparisons.

The data of this strand were analysed by hand. This firstly entailed reading through all survey responses inductively to obtain a general sense of the dataset. In the semi-structured surveys, the case study students, parents and teachers were asked the same open-ended questions in the four main areas, including a description of the nature of the student's disabilities, the effects of the student's disabilities on classroom learning and assessment, stakeholders' perspectives about classroom assessment adjustments, and the effects of adjustments on achievement outcomes in the specific subject areas. Thus, tables were created in Word for each case study to transfer the Student, Parent, and Teacher survey responses into a worksheet based on the above-mentioned areas. Specific quotes from the participants that described similar and different elements were colour coded based on iterative readings. These codes were then used to make the underpinning patterns and provide a comprehensive description of the case study student. To create a visible image of the nature of the student's disabilities, descriptions reported by the student, parent and teacher were presented in a comparison table (see Chapter 5). Furthermore, to give voice to the participants and provide the reader with more accurate perspectives of the stakeholders (students, parents, teachers), many direct passages from the surveys are included in the descriptions. In the reporting of findings, the structured survey question options selected by participants are indicated by single quotation marks, and verbatim quotations from open-ended survey responses are indicated by double quotation marks.

To explore the individual student's academic achievement in relation to the adjustments made within the classroom, a four-step structured approach to analysis was used: (1) the extent to which the adjustments addressed the target skills and functional impairments in access skills required to complete the assessment task; (2) the extent to which the adjustments matched the needs identified by the student, parent and teacher; (3) investigation of the validity of the assessment adjustments in terms of the curriculum content and focus of grading rubrics; and (4) the extent to which adjustments reflected recommendations based on research for appropriate adjustments addressing the needs of the students based on their identified disability characteristics.

As noted in Chapter 2, awareness of access skills or prerequisite skills that students require to undertake a particular task is a decisive factor to make appropriate adjustments (Kettler, 2015). In this study, impairment in access skills was considered as learning challenges that precluded the case study students from doing their assessment tasks. Target skills are the knowledge and skills that are intended to be assessed by a task. Target skills were identified using assessment artefacts, including the grading schema or rubric and samples of the students' assessment work in the focus subjects. As reported in Chapter 5, for each case study, a diagram was developed that illustrates the interconnection between the adjustments made and academic achievement with regard to access and target skills required to undertake the task. Interconnecting categories is an analytical approach to display a sequence of events (Creswell & Guetterman, 2021).

The validity of assessment adjustments and grades under an adjusted situation was investigated through three issues (Sireci, 2008): (a) did the provision of adjustments alter the target skills of assessment? If so, how? (b) did the provision of adjustments improve the measurement of the student's knowledge and abilities? If so, how? (c) was the student grade from the adjusted assessment comparable to grades of students without disabilities under unadjusted assessment?

Following the completion of individual within-case analyses, an across-case analysis, reported in Chapter 6, was conducted to investigate academic achievement of students with disabilities under adjusted situations in relation to their academic wellbeing and provide an interpretation of the synthesised meanings of all the cases. As previously mentioned, academic wellbeing has been conceptualised in this study as comprised of academic self-concept, academic responsibility, and school satisfaction. The four case study students with disabilities completed the Academic Wellbeing Questionnaire. As noted earlier for Strand 1 of the study, academic self-concept included three subscales: Mathematics Self-concept, English Self-concept, and General School Self-concept. Each academic subscale consists of 10 items measured by a six-point Likert, ranging from 1= false to 6= true. As noted in Strand 1, the minimum and maximum scores for each subscale were 10 and 60, respectively.

The Intellectual Achievement Responsibility Scale (Crandall et al., 1965) comprised two subscales: internal responsibility for success (8 items) and internal responsibility for failure (6 items). Each subscale's statement had two alternatives: either the event is the result of a student's action, or some external factor causes it. The student received 0 for selecting an external factor and a score of 1 for choosing an internal factor for success and failure. The School Satisfaction subscale consists of eight statements measured by a six-point Likert, ranging from 1= strongly disagree to 6 = strongly agree. As noted, the minimum and maximum score for this subscale was 8 and 48, respectively.

Total scores for attitudinal subscales were calculated for each case study student separately. As for the quantitative data analyses, scores for each subscale were then averaged (total response divided by number of items) for use in analyses. These scores were also used to compare the case study student's academic self-concepts, academic responsibility, and school satisfaction with those of students with and without disabilities in Strand 1 of the study. Accordingly, Box Plots were created to provide a visual representation of averaged scores on the variables of interest for three groups of the participating students (see Chapter 6). Further, a comparison table was created to represent the responses rated by each student (see Appendix E). Similar responses to the survey statements were then highlighted to provide examples of the case study students' perception of their academic capabilities and school experiences.

As reported in Chapter 5, the participating teachers provided students' work samples for two students Alfie and Liam, in Mathematics coupled with the adjustments provided in the Mathematics assessment. Thus, the students' Mathematics outcomes, achieved under adjusted conditions, in relation to their Mathematics Self-concept, Academic Responsibility, and School Satisfaction were investigated. Further, two other teachers provided the adjusted work samples in English assessment for two students, Daniel and Leo. Therefore, the interconnection between English grades of these students and their English Self-concept was addressed. Additionally, the students' English outcomes were investigated in relation to their Academic Responsibility and School Satisfaction. The findings relating to the association between the case study students' English and Mathematics Achievement and the classroom assessment adjustments, reported in Chapter 5, were used for cross-case analysis. For each subject area, English and Mathematics, commonalities and differences were addressed based on the students' access skills impairments, the selected adjustments, the achieved grades, and their scores in academic wellbeing components. In terms of academic wellbeing, higher scores indicate higher levels of domain-specific academic self-concepts, academic responsibility, and school satisfaction.

3.3.5.1 Credibility

Credibility is defined as the degree of fit between the participant's views and the researcher's representation of them (Stake, 2010; Teddlie & Tashakkori, 2009). At least two strategies are required to check the accuracy of research study (Creswell & Creswell, 2018). In this study, credibility was achieved through triangulation. Triangulation is considered a qualitative research strategy to investigate validity through comparing data from varied sources (Stake, 2006). Patton (1999) suggested the four types of triangulation: (a) method triangulation, (b) theory triangulation, (c) investigator triangulation, and (d) data source triangulation. In method triangulation, multiple data collection methods (i.e., interview, observation, survey) are used to investigate the same phenomenon under study. In this research, surveys were utilised to analyse the qualitative research questions. Thus, method triangulation was inappropriate for this research study. For theory triangulation, different theories are used to analyse and interpret data and support or refute findings.

Investigator triangulation includes at least two researchers' participation to observe the same phenomenon (Stake, 1995). Stake (2010) posited that 'multiple eyes' is one of the important forms of triangulating. As previously noted, the qualitative database of this strand of the study was obtained from the ACAP project. In that project, my Principal supervisor was one of the chief investigators, and I worked as her research assistant. Therefore, my supervisor was completely familiar with the qualitative data used for my research study. To minimise misrepresentation and misunderstanding, I discussed the categorised data and analyses with my supervisor to ensure that concepts and ideas have been accurately reported and key meanings have not been overlooked. Analysis of data from different perspectives can provide a confirmation of findings from different perspectives (Stake, 1995).

Data source triangulation merges data obtained from different sources and at different times, in different settings or from different participants (Flick, 2004). In this study, the survey data were drawn from three groups of participants, including the students with disabilities, their parents, and teachers. The response data were triangulated to develop a more precise description of participants' judgments about the classroom assessment adjustments from multiple perspectives. This type of triangulation enhances credibility (comparable to internal validity in quantitative research) of interpretations from the data. As noted in the data analysis section, many direct passages from the surveys were used in the descriptions to provide more accurate experiences and perspectives of the students, parents and teachers and to enhance trustworthiness in this study.

3.4. Ethical Considerations

This research study has been approved by the Human Research Ethics Committee at Australian Catholic University (HREC: 2018-51H). As previously noted, this research aligned with the ACAP and ethics approval by HREC at Australian Catholic University (HREC 2017-39H). Participation in this research study was completely voluntary. If a student agreed to participate, they had the right to withdraw from the project at any time without any negative consequences. The participant Information Letters included the purpose of the study and possible risks and benefits of participating in this project. Moreover, detailed information was provided about the confidentiality and the anonymity of participants. It was mentioned in the questionnaire that: this was not a test; that there were no right or wrong answers; students' answers did not affect their grades; and their responses were kept unidentifiable and confidential and were not shared with school staff or others.

Research procedures utilised to conduct this project were based on the following ethical principles. In Strand 1 of the study, both students with and without disabilities were asked to complete the questionnaire during their class time in order to avoid identification and discrimination against students with disabilities in the classroom. Further, the questionnaire used in this research study was slightly modified so that students with disabilities could participate in this research activity on the same basis as students without disabilities. The NCCD information provided by schools was used to identify the participating students with disabilities for data analysis purposes. Therefore, this procedure minimised any potential effects felt by those identified as having a disability. Once the questionnaires were completed by students, their names were removed from the questionnaire and replaced with an assigned code.

In Strand 2 of the study, participants were students with disabilities who had already participated in ACAP. Students were therefore allocated the same personalised ID code previously used in ACAP to complete the online questionnaires. When data collection was completed, data were downloaded and saved to an ACU shared drive accessible by only the research team. Access was password-protected. All paper ACAP files were destroyed at the ILSTE office of the Australian Catholic University. Electronic copies of de-identified data from this study will be securely stored for a period of five years as required under ethical guidelines.

3.5. Chapter Summary

A parallel mixed method design was used in this research study. Data were collected separately in two strands. In Strand 1 of the study, 122 Australian students with and without disabilities in Years 7 to 9 completed a questionnaire comprised of three scales (academic self-concept, academic responsibility, school satisfaction). The English and Mathematics classroom assessment grades were utilised as an indicator of students' academic achievement. The NCCD information was used to identify the participating students with disabilities and the level of adjustments provided.

In Strand 2 of the study, first, data were obtained from existing collected data for the ACAP. The ACAP database consisted of two components: Survey Data (student, parent, teacher) and Student Assessment Data (Mathematics and English grades, artefacts related to student assessment tasks with adjustments). Second, four Years 7 to 9 students with disabilities were identified as case study students. They completed a further questionnaire comprised of the three scales completed by students in Strand 1 of the study. The four case study students had already participated in ACAP and agreed to participate in this research study. The data collected for both quantitative and qualitative strands of the study were separately analysed to make inferences that shape a meta-inference in this research study. In the next chapter, findings for Strand 1, the quantitative strand of this study, are presented.

CHAPTER 4: Results of Quantitative Analysis — Strand 1

4.0. Overview

This chapter presents findings for Strand 1 of the mixed methods research study, the quantitative correlational and comparative study. Strand 1 was undertaken to provide empirical evidence of the relationship and differences between academic achievement and academic wellbeing for secondary students with and without disabilities in Australia. This evidence provides the framework for examining the principal focus of the study, the relationship between classroom assessment adjustments, academic achievement and academic wellbeing for Australian students with disabilities.

Academic wellbeing is conceptualised in this study as being comprised of academic self-concept, academic responsibility, and school satisfaction. As noted in Chapter 2, Literature Review, positive academic self-concept, academic responsibility, and school satisfaction are believed to be fundamental for students' wellbeing and their academic success. Therefore, identifying students at risk of negative self-beliefs and putting learning supports in place to enhance a more positive self-concept and school experience may improve educational outcomes. On the other hand, given that increasing numbers of students with disabilities are being educated in mainstream schools (Education Services Australia, 2020a), the level of academic self-concept and school satisfaction may be useful indicators of how inclusive these classrooms are. However, in comparison with the large number of studies regarding the relationship between academic achievement and academic wellbeing for students without disabilities (Fu et al., 2020; Susperreguy et al., 2018), relatively little research has been conducted in these areas specifically for students with disabilities (Alnahdi & Schwab, 2020; Gallagher et al., 2020). Existing relevant research for students with disabilities has produced mixed findings in terms of whether academic achievement and academic wellbeing are correlated. Such research has generally been conducted internationally but rarely with Australian students (Datta & Talukdar, 2016). Therefore, to provide clearer evidence of relationship between academic achievement and academic wellbeing for secondary school students with and without disabilities in Australia, a quantitative study was conducted. Further, to provide insight into whether this relationship may be affected by the extent of a student's disabilities, academic achievement and academic wellbeing were analysed with regard to the NCCD level of adjustments for students with disabilities.

The following research questions were addressed by the quantitative study:

Research Question 1: What is the relationship between academic achievement and academic wellbeing (academic self-concept, academic responsibility, and school satisfaction) for Australian secondary students with and without disabilities?

Research Question 2: Are there differences in academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) between secondary students with and without disabilities?

Research Question 3: Are there differences in academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) across the NCCD levels of implemented adjustments for secondary students with disabilities?

This chapter is structured into three sections. The first section presents descriptive statistics of participants' demographic information. The statistics reported are percentages, means and standard deviations for academic achievement, academic self-concept, academic responsibility, and school satisfaction. Skewness and kurtosis of data were examined to determine the distributions of variables to identify appropriate inferential statistical comparisons. The results from the main analyses, correlational and comparative analyses, are presented in the second section. The chapter summary is provided in the third section. Discussion of these quantitative findings is presented in Chapter 7.

4.1. Participants and Distributions of Responses

Participants in this study were students with and without disabilities in Years 7, 8 and 9, attending three secondary schools: 109 students in Queensland and 13 students in Victoria. Approximately 57% of the students were female and 43% of the students were male. For the group of students with disabilities, the number of male students was twice that of female students, whereas around 70% of the students without disabilities were female. Approximately 90% of the participants were Year 7 and 8 students. Table 4.1 summarises the participants' demographic information.

Table 4. 1

Participants' Demographic Information

Ability Status	Sex		Year Level			Total
	Female	Male	7	8	9	
With disabilities	14 (11.47%)	28 (22.95%)	21 (17.21%)	15 (12.30%)	6 (4.92%)	42 (34.43%)
Without disabilities	55 (45.08%)	25 (20.49)	36 (29.51%)	40 (32.78%)	4 (3.27%)	80 (65.57%)
Total	69 (56.55%)	53 (43.44%)	57 (46.72%)	55 (45.08%)	10 (8.19%)	122 (100%)

In 2019, the Nationally Consistent Collection of Data (NCCD) indicated approximately 20% of Australian students were reported to have a disability (Australian Curriculum, Assessment and Reporting Authority [ACARA], 2020). Therefore, in this sample the students with disabilities were overrepresented[6]. However, the emphasis in data collection advice to schools was to provide classes in which there were students with disabilities, to ensure sufficient sample size for analyses. As shown in Table 4.2, the largest subgroup of participating students, as defined by the NCCD category of disabilities, was students with cognitive disabilities (65.5%; n = 19), followed by students with social/emotional disabilities (27.6%; n = 8), and students with physical disabilities (6.9%; n = 2). Support, based on the NCCD classifications, was provided within Quality Differentiated Teaching Practices (QDTP) for approximately 34.5% of students. Approximately 45% of students with disabilities received a Supplementary level of adjustments (n = 13), and only 20.7% of the students were identified as requiring a Substantial level of adjustment. The two students with physical disabilities and four students with cognitive disabilities in this study received the Substantial level of adjustments.

Table 4. 2

Descriptive Statistics for Students with Disabilities Based on NCCD Category of Disabilities and the Level of Implemented Adjustments

Gender	Category of disabilities			Levels of adjustments		
	Cognitive	Social/emotional	Physical	QDTP	Supplementary	Substantial
Female	6	5	-	6	5	-
Male	13	3	2	4	8	6
Total	19 (65.51%)	8 (27.58%)	2 (6.89%)	10 (34.48%)	13 (44.82%)	6 (20.68%)

Note. QDTP: Quality Differentiated Teaching Practice

In 2019, NCCD data indicated that 54% of Australian students with disabilities were identified as having a primary cognitive disability, 28% social/emotional disabilities,

[6] . The quantitative data of this study were collected from late 2018 to mid-2020.

and 12.6% physical disabilities. Therefore, the students participating in this study have a proportional distribution somewhat equivalent to Australian students with disabilities in general, with a slight overrepresentation of students with cognitive disabilities and fewer with physical disabilities. However, data collection did not occur with students in special schools, included in the NCCD, where students with extensive support needs may be educated. No participating students in this study were identified as reported under the NCCD category of ‘Sensory’ disabilities (Education Council, 2019a). Thirty-four per cent of Australian students with disabilities were identified in NCCD data as having the QDTP level of support, 42% as having Supplementary level of support, and 16% as having a Substantial level of support (Education Council, 2019a). Participants in this study had very similar distribution of levels of adjustments to the Australian population of students with disabilities. No students were reported as having an ‘Extensive’ level of support, again potentially reflecting data collection only in mainstream schools. The distribution of NCCD characteristics of students participating in this study therefore provide some opportunity for generalisation of findings to broader populations of secondary students with disabilities.

The variables in the quantitative study, as described in Chapter 3, were school assessments of Mathematics and English Achievement, Mathematics Self-concept, English Self-concept, General School Self-concept, Academic Responsibility (Internal Responsibility for Success and Failure), and School Satisfaction, as well as the NCCD level of adjustment. To address the research questions and explore relationships between variables, it was necessary to examine first the distributions of response data for students in the study, and suitability for further analyses.

Descriptive statistics were undertaken to calculate the mean, standard deviation, skewness and kurtosis values for all the variables of interest, shown in Table 4.3. The skewness and kurtosis statistics, their standard errors and the Z scores of the skewness and kurtosis for each variable were computed to evaluate the data for possible violations of normality. According to George and Mallery (2018), a $Z_{skewness}$ or $Z_{kurtosis}$ between +/- 1.00 is considered excellent, while a value of +/- 2.00 is considered acceptable. In this study, skewness and kurtosis values were used. Overall, the means, and distributions of student attitudinal data show use of the full range of response options and the standardised skewness and kurtosis values were within the excellent range. The Mathematics and English Achievement scores for study participants were slightly platykurtic, which reflects the ordinal nature of the achievement scores and the high percentage of students receiving the highest possible grade for English and Mathematics. For all variables, the sample size was greater than 118 and hence the Central Limit Theorem implies that the sample mean could be considered to be approximately normally distributed. Additionally, the $Z_{kurtosis}$ scores for these variables were acceptable for parametric testing of differences in means. Therefore, parametric statistical analyses were undertaken to address the research questions and examine differences in relationships among the variables between students with and without disabilities.

Table 4. 3

Descriptive Statistics for Research Variables

Variables	N	Mean (SD)	Min (%)	Max (%)	Skewness (SE)	Kurtosis (SE)
Mathematics Achievement	120	3.87 (1.037)	2.00 (11.7%)	5.00 (35.8%)	-.373 (.221)	-1.099 (.438)
English Achievement	119	3.77 (0.952)	2.00 (6.7%)	5.00 (29.4%)	-.009 (.222)	-1.177 (.440)
Mathematics Self-concept	122	4.27 (1.362)	1.00 (2.5%)	6.00 (3.3%)	-.748 (.219)	-.261 (.435)
English Self-concept	122	4.03 (0.938)	1.50 (0.8%)	5.70 (0.8%)	-.267 (.219)	-.551 (.435)
General School Self-concept	122	4.36 (1.066)	1.10 (0.8%)	5.90 (2.5%)	-.829 (.219)	.247 (.435)
Internal Responsibility-Success	122	5.43 (1.233)	2.00 (3.3%)	8.00 (0.8%)	-.729 (.219)	.365 (.435)
Internal Responsibility-Failure	118	3.43 (1.471)	0.00 (3.3%)	6.00 (9.0%)	-.154 (.219)	-.383 (.435)
School Satisfaction	121	4.06 (1.106)	1.00 (0.8%)	6.00 (0.8%)	-.482 (.220)	-.400 (.437)

4.2. Analyses Addressing the Research Questions

4.2.1. Correlational Analyses

*Research Question 1***: What is the relationship between academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) for Australian secondary students with and without disabilities?**

(i) Findings for all students

Pearson's correlation coefficients were used to examine this research question. First, findings relating to the association between academic achievement and academic wellbeing components are presented for all students (see Table 4.4). Second, these relationships were analysed separately for students with and without disabilities to show how the overall results might mask differences between these groups (see Table 4.5).

Table 4. 4

Pearson Correlation Matrix for Academic Achievement and Academic Wellbeing for All Students (n=122)

Variables	1	2	3	4	5	6	7
All students							
1. Mathematics Achievement	1						
2. English Achievement	$.689^{**}$	1					
3. Mathematics Self-concept	$.737^{**}$	$.434^{**}$	1				
4. English Self-concept	$.314^{**}$	$.448^{**}$	$.249^{**}$	1			
5. General School Self-concept	$.625^{**}$	$.569^{**}$	$.695^{**}$	$.607^{**}$	1		
6. Internal Responsibility-Success	$.197^{*}$	.125	$.348^{*}$	.167	$.369^{**}$	1	
7. Internal Responsibility-Failure	.091	.162	-.005	$.210^{*}$	.081	$.198^{*}$	1
8. School Satisfaction	$.294^{**}$	.172	$.570^{**}$	$.290^{*}$	$.490^{**}$	$.591^{**}$	.155

Note. $^{**}p < .01$, $^{*}p < .05$

Academic achievement and academic self-concept: Findings showed statistically significant and positive relationships between Mathematics Achievement and Mathematics Self-concept ($r = .737$, $p < .01$), English Self-concept ($r = .314$, $p < .01$), and General School Self-concept ($r = .625$, $p < .01$). Similarly, a statistically significant and positive relationship was found between English Achievement and English Self-concept ($r = .448$, $p < .01$), Mathematics Self-concept ($r = .434$, $p < .01$), and General School Self-concept ($r = .569$, $p < .01$). However, as shown in Table 4.4, the relationship between Mathematics Achievement and Mathematics Self-concept ($r = .737$) was stronger than between Mathematics Achievement and English Self-concept ($r = .314$). Similarly, the correlation between English Achievement and English Self-concept ($r = .448$) was stronger than between Mathematics Achievement and English Self-concept ($r = .434$).

Academic achievement and academic responsibility: The findings revealed a weak but statistically significant relationship between Mathematics Achievement and Internal Responsibility for Success ($r = .197$, $p < .05$). However, Mathematics Achievement was not related to Internal Responsibility for Failure ($r = .091$, $p = .321$). No statistically significant relationship was found between English Achievement and Internal Responsibility for Success ($r = .125$, $p = .174$) or Failure ($r = .162$, $p = .07$). As presented in Table 4.4, Internal Responsibility for Failure showed the weakest relationship with the other variables.

Academic achievement and school satisfaction: Findings demonstrated that Mathematics Achievement was statistically significant and positively related to School Satisfaction ($r = .294$, $p < .01$), whereas English Achievement was unrelated to School Satisfaction ($r = .172$, $p = .063$), for all participating students. As shown in Table 4.4, School Satisfaction was also significantly and positively correlated with Mathematics Self-concept (*r* = .570, *p* < .01), English Self-concept (r = .290, *p* < .05), General School Self-concept (*r* = .490, *p* < .01), and Internal Responsibility for Success (*r* = .591, *p* < .01).

(ii) Findings for comparisons of secondary students with and without disabilities

Comparisons of outcomes for students with and without disabilities are presented in Table 4.5. These are discussed in relevant groupings.

Table 4. 5

Pearson Correlation Matrix for Academic Achievement and Academic Wellbeing for Students with Disabilities (n=42) and Students without Disabilities (n =80)

Variables	1	2	3	4	5	6	7
Students without disabilities							
1. Mathematics Achievement	1						
2. English Achievement	.528**	1					
3. Mathematics Self-concept	.619**	.205	1				
4. English Self-concept	.141	.394**	.037	1			
5. General School Self-concept	.417**	.400**	.509**	.542**	1		
6. Internal Responsibility-Success	.073	-.005	.215	-.030	.162	1	
7. Internal Responsibility-Failure	.051	.180	.002	.168	.031	.300**	1
8. School Satisfaction	.172	.057	.490**	.206	.435**	.504**	.258*
Students with disabilities							
1. Mathematics Achievement	1						
2. English Achievement	.621**	1					
3. Mathematics Self-concept	.695**	.332*	1				
4. English Self-concept	.201	.216	.213	1			
5. General School Self-concept	.543**	.465**	.693**	.553**	1		
6. Internal Responsibility-Success	.141	.082	.404**	.325*	.495**	1	
7. Internal Responsibility-Failure	-.117	-.104	-.249	.142	-.075	-.038	1
8. School Satisfaction	.435**	.228	.678**	.338*	.559**	.696**	-.064

Note. ***p* < .01, **p* < .05

Academic achievement and academic self-concept: Findings showed that Mathematics Achievement was statistically significant and positively related to Mathematics Self-concept ($r = .619$, $p < .01$) for students without disabilities. Similarly, English Achievement and English Self-concept were statistically significant and positively correlated (r = .394, p < .01) for this group. For students with disabilities, Mathematics Achievement had a statistically significant and positive relationship with Mathematics Self-concept (r = .695, p < .01). However, no statistically significant relationship was found between English Achievement and English Self-concept (r = .216, p = .186). General School Self-concept was related to Mathematics Achievement for both groups of students with disabilities (r = .543, p < .01) and students without disabilities (r = .417, p < .01). General School Self-concept was also related to English Achievement for students with disabilities (r = .465, p < .01) and students without disabilities (r = .400, p < .01).

Academic achievement and academic responsibility: Results indicated that Mathematics Achievement was not correlated with Internal Responsibility for Success for both students with disabilities (r = .141, p = .386) and students without disabilities (r = .073, p = .520). Similarly, no statistically significant relationship emerged between Mathematics Achievement and Internal Responsibility for Failure for students with disabilities (r = -.117, p = .473) and students without disabilities (r = .051, p = .651).

Findings showed no statistically significant relationship between English Achievement and Internal Responsibility for Success for either group (students with disabilities, r = .082, p = .619; students without disabilities, r = -.005, p = .965). Similarly, English Achievement was unrelated to Internal Responsibility for Failure for students with disabilities (r = -.104, p = .528) and students without disabilities (r =.180, p = .109).

Academic achievement and school satisfaction: Findings demonstrated that there were no statistically significant relationships between Mathematics Achievement (r = .172, p = .126) and English Achievement (r = .057, p = .618) and School Satisfaction for students without disabilities. Mathematics Achievement and School Satisfaction were positively associated (r = .435, p < .01) for students with disabilities, but no relationship was found between English Achievement and School Satisfaction (*r* = .228, *p* = .169) in this group.

As shown in Table 4.5, intercorrelations were generally stronger for students with disabilities when compared with students without disabilities. School Satisfaction was associated with Mathematics Self-concept (*r* =.678, *p* < .01), English Self-concept (*r* = .338, *p* < .05), General School Self-concept (*r* = .559, *p* < .01), and Internal Responsibility for Success (*r* = .696, *p* < .01) for students with disabilities. Of note, for students with disabilities, but not students without disabilities, Internal Responsibility for Success was significantly correlated with academic self-concept for Mathematics (*r* = .404, *p* < .01), English (*r* = .325, *p* < .05), and General School Self- Concept (*r* =.495, *p* < .01), despite the lack of correlation with academic achievement in either English or Mathematics. In contrast, there was a statistically significant relationship between Internal Responsibility for Success and Internal Responsibility for Failure for students without disabilities (*r* = .300, *p* < .01) but not for students with disabilities.

As disability status was a binary variable, Kendall's tau-b correlation coefficient was used to examine correlations of disability status and the variables of interest. The findings indicated that having a disability was associated with lower levels of Mathematics Achievement (τb = -.540, *p* < .001) and English Achievement (τb = -.481, *p* < .001). Similarly, having a disability was strongly negatively related to Mathematics Self-concept (τb = -.358, *p* < .001), English Self-concept (τb = -.266, *p* < .001), and General School Self-concept (τb = -.394, *p* < .001). Disability status was weakly related to Internal Responsibility for Failure (τb = -.178, *p* < .05) but not to Internal Responsibility for Success (τb = -.154) or School Satisfaction (τb = -.091). The nature of these differences is explored in the findings, Chapter 4, for Research Question 2.

4.2.2. Comparative Analyses

Research Question 2: **Are there differences in academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) between secondary students with and without disabilities?**

Independent-samples t-tests were conducted to compare mean scores for academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) for students with and without disabilities. Results of t-tests and effect sizes are presented in Table 4.6. The effect sizes for the study variables were calculated by Glass et al.’s formula (1981): $\Delta = (M_{control} - M_{experiment}) / SD_{control}$. To interpret effect sizes, Cohen’ rules (1988; small effect size: 0.2; medium effect size: 0.5; large effect size: 0.8) were used. An overview of the differences between students with and without disabilities in the variables of interest is provided in Figures 4.1 to 4.8.

Table 4. 6

Results of Independent-Sample T Tests and Effect Sizes for Academic Achievement and Academic Wellbeing of Students with Disability (n = 42) and Students without Disabilities (n = 80)

Variables	With disabilities		Without disabilities		t	p	Δ
	M	SD	M	SD			
Mathematics Achievement	3.00	.847	4.30	.832	8.01^{***}	<.001	1.56
English Achievement	3.07	.702	4.11	.871	6.46^{***}	<.001	1.19
Mathematics Self-concept	3.41	1.42	4.72	1.08	5.64^{***}	<.001	1.21
English Self-concept	3.59	.946	4.26	.852	3.94^{***}	<.001	0.78
General School Self-concept	3.60	1.20	4.75	.719	6.60^{***}	<.001	1.59
Internal Responsibility-Success	5.09	1.30	5.60	1.16	2.18^{*}	.031	0.43
Internal Responsibility-Failure	3.04	1.56	3.63	1.38	2.13^{*}	.035	0.42
School Satisfaction	3.82	1.19	4.17	1.04	1.63	.105	0.33

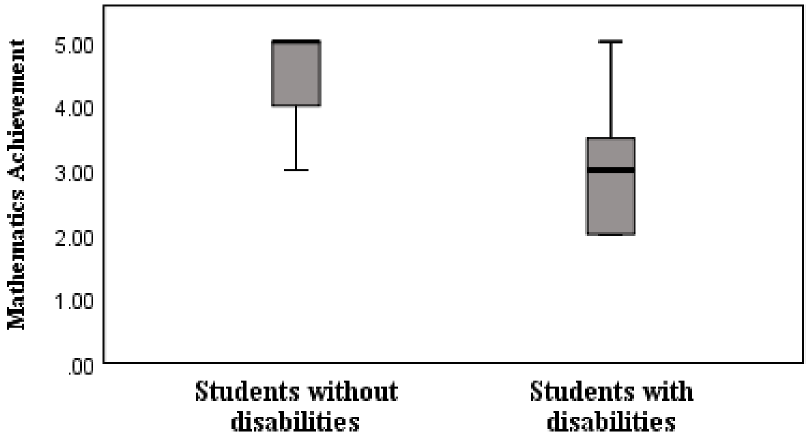
Note. small effect size: 0.2; medium effect size: 0.5; large effect size: 0.8 (Rule of thumb for interpretation of effect sizes, Cohen, 1988).

$^{***}p < .001$ and $^{*}p < .05$

Difference in academic achievement between students with and without disabilities: Results showed that the mean score for Mathematics Achievement of students without disabilities (M = 4.30, SD = .83) was statistically significantly higher than that of students with disabilities (M = 3.00, SD = .84; t (118) = 8.01, p < .001). As noted in Chapter 3, to analyse students' academic achievement, letter grades of A, B, C, D and E were converted to numerical scores of 5, 4, 3, 2, and 1 respectively. As shown in Figure 4.1, a small percentage of students with disabilities were achieving at the same high level as a large percentage of students without disabilities.

Figure 4. 1

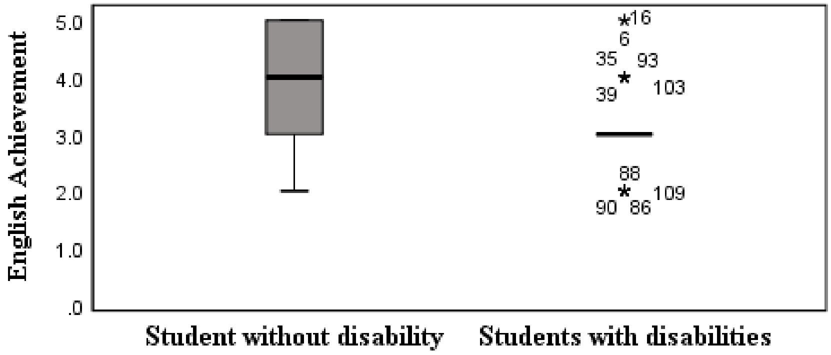
Box Plot Distributions for Scale Scores on Mathematics Achievement for Students with and without Disabilities



Similarly, students without disabilities achieved significantly higher scores in English Achievement (*M* = 4.11, *SD* = .87) compared with students with disabilities (*M* = 3.07, *SD* = .70; *t* (117) = 6.46, *p* <.001) (see Table 4.6). The magnitude of effect sizes for differences in Mathematics (*d* =1.56) and English Achievement (*d* =1.19) were very large, reflecting that the academic achievement of the students without disabilities was considerably higher compared with the students with disabilities. As shown in Figure 4.2, there are 10 outliers in the groups of students with disabilities that show they were both very high achievers and very low achievers in English. This highlights that students with disabilities are not necessarily low achievers in mainstream schools.

Figure 4. 2

Box Plot Distributions for Scores on English Achievement for Students with and without Disabilities



Differences in academic self-concept between students with and without disabilities: Findings revealed that there was a statistically significant difference between the students with and without disabilities in their mean scores on English Self-concept (t (120) = 3.94, p <.001, d = 0.78), Mathematics Self-concept (t (120) = 5.64, p <.001, d = 1.21) and General School Self-concept (t (120) = 6.60, p <.001, d = 1.59), suggesting that the students without disabilities had higher self-concept in Mathematics, English, and School overall compared with the students with disabilities. Effect sizes indicated that the differences in English and General School self-concept were large between the students with and without disabilities. Distributions of scores on domain-specific self-concepts for students with and without disabilities are presented in Figures 4.3, 4.4, and 4.5. The findings indicated that 50% of students with disabilities achieved 3 or less in subscales of Mathematics, English, and General School Self-concept.

Figure 4. 3

Box Plot Distributions for Scale Scores on Mathematics Self-concept for Students with and without Disabilities

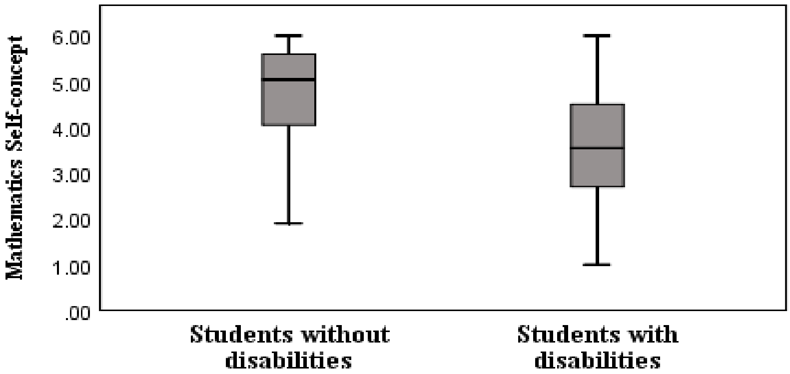


Figure 4. 4

Box Plot Distributions for Scale Scores on English Self-concept for Students with and without Disabilities

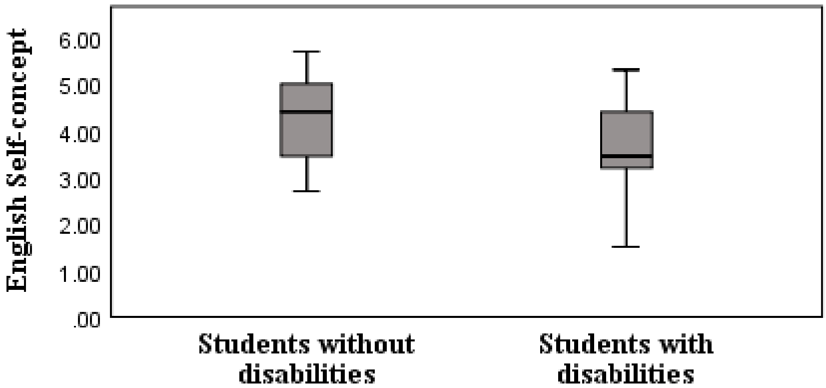
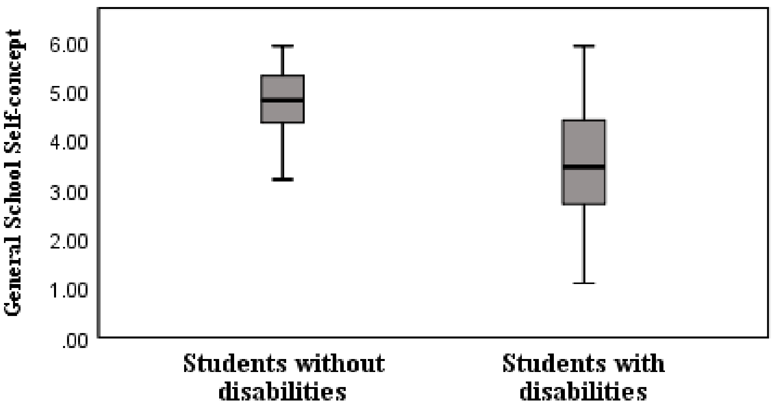


Figure 4. 5

Box Plot Distributions for Scale Scores on General School Self-concept for Students with and without Disabilities



Differences in academic responsibility between students with and without disabilities: Findings showed that there was a statistically significant difference in the mean scores for Internal Responsibility for Success between students with disabilities (M = 5.09, SD = 1.30) and students without disabilities (M = 5.60, SD = 1.16; t (120) = 2.18, p = .031). A significant difference was found in the mean scores of Internal Responsibility for Failure between students with disabilities (M = 3.04, SD = 1.56) and students without disabilities (M = 3.63, SD = 1.38; t (120) = 2.13, p = .035), suggesting the students with disabilities were less likely to attribute academic failures to internal factors but were more likely to attribute failure to themselves. The effect sizes for the construct Internal Responsibility for Success (d = .43) and Failure (d = .42) were small to medium. Distributions for median scores on Internal Responsibility for Success and Failure for students with and without disabilities are presented in Figures 4.6 and 4.7 respectively. Findings showed that 50% of students with disabilities achieved a score of 5 and above, while 50% of students without disabilities achieved 6 and above in subscale of Internal Responsibility for Success. However, 16.5% and 27.5% of students with and without disabilities achieved a score of 5 and above, respectively, in subscale of Internal Responsibility for Failure.

Figure 4. 6

Box Plot Distributions for Scale Scores on Internal Responsibility for Success for Students with and without Disabilities

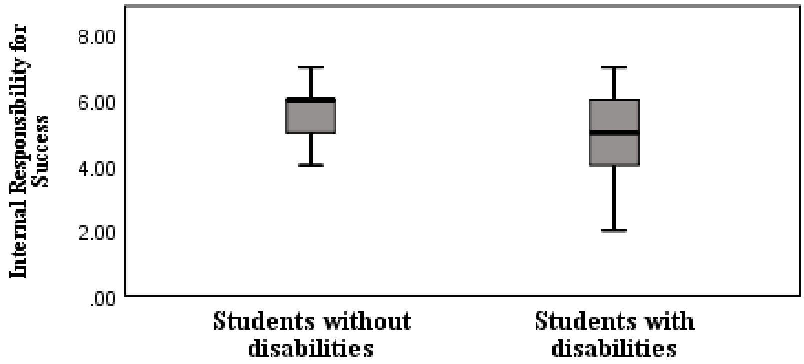
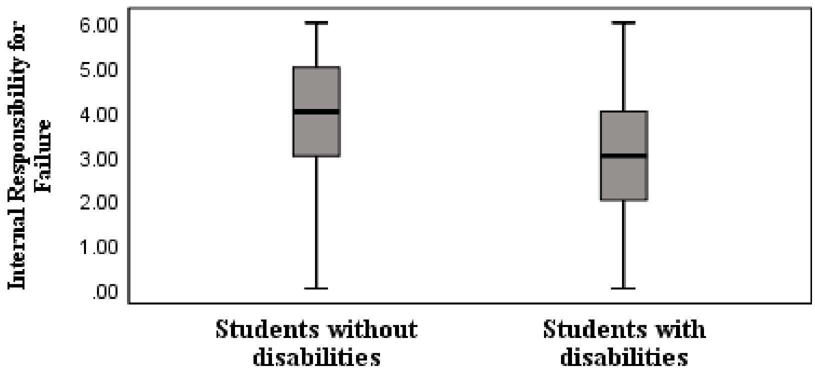


Figure 4. 7

Box Plot Distributions for Scale Scores on Internal Responsibility for Failure for Students with and without Disabilities

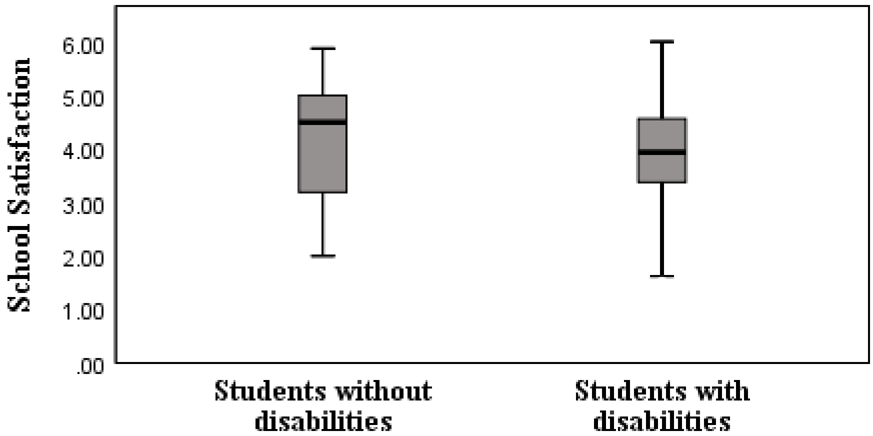


Findings for differences between Internal Responsibility for Success and Failure: The mean score for Internal Responsibility for Success was compared with the mean score for Internal Responsibility for Failure using a paired-sample t-test for each group of students. Findings indicated that students without disabilities tended to take more Internal Responsibility for Success than Failure (t (79) = 11.53, p < .001). Similarly, students with disabilities were more likely to take more Internal Responsibility for Success than their Failure (t (41) = 6.41, p < .001). The eta squared statistic was .50 and .80, for students with and without disabilities, respectively, indicating a large effect size (calculated as Eta squared = $\frac{t^2}{t^2+(N+1)}$; Pallant, 2011).

Difference in school satisfaction between students with and without disabilities: Comparison of the mean scores for School Satisfaction between the students with and without disabilities revealed that the students with disabilities (*M* = 3.82, *SD* = 1.19) were slightly less satisfied with school than the students without disabilities (*M* = 4.17, *SD* = 1.04; *t* (119)=1.63, *p* = .105). However, no statistically significant difference was found. Box Plot distributions for scale scores on School Satisfaction for students with and without disabilities (Figure 4.8), demonstrate the similarity of distributions but slight differences in School Satisfaction between the two groups. Again, a proportion of students with disabilities were satisfied with school, but a greater proportion, but not statistically different, in comparison with students without disabilities, were not.

Figure 4. 8

Box Plot Distributions for Scale Scores on School Satisfaction for Students with and without Disabilities



Research Question 3: **Are there differences in academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) across the NCCD levels of implemented adjustments for secondary students with disabilities?**

A one-way between-groups analysis of variance (ANOVA) was used to compare the academic achievement and academic wellbeing components across the NCCD levels of adjustments (QDTP, Supplementary, Substantial). One-way ANOVA results for research variables based on the level of adjustments are presented in Table 4.7.

Table 4. 7

Results of One-way ANOVA for the Level of Adjustments and Research Variables for Students with Disabilities (N=29)

Variables	Level of adjustments	*N*	*M*	*SD*	$F_{2,26}$	*p*
Mathematics Achievement	QDTP	10	3.20	0.63	1.056	.362
	Supplementary	13	2.69	0.75		
	Substantial	6	3.00	1.26		
English Achievement	QDTP	10	3.30	0.82	.683	.514
	Supplementary	13	3.07	0.64		
	Substantial	6	2.83	0.98		
Mathematics Self-concept	QDTP	10	3.17	1.56	.756	.480
	Supplementary	13	3.06	1.30		
	Substantial	6	3.88	1.23		
English Self-concept	QDTP	10	3.84	0.97	.647	.532
	Supplementary	13	3.54	0.68		
	Substantial	6	3.31	1.24		
General School Self-concept	QDTP	10	3.63	1.14	.225	.800
	Supplementary	13	3.30	1.14		
	Substantial	6	3.51	1.38		
Internal Responsibility-Success	QDTP	10	5.20	1.39	.305	.739
	Supplementary	13	4.84	1.62		
	Substantial	6	4.66	0.81		
Internal Responsibility-Failure	QDTP	10	3.00	1.56	.182	.835
	Supplementary	13	3.30	1.79		
	Substantial	6	2.83	1.83		
School Satisfaction	QDTP	10	3.80	1.34	.123	.885
	Supplementary	13	3.55	1.21		
	Substantial	6	3.75	0.96		

Note. QDTP: Quality Differentiated Teaching Practices

No statistically significant differences emerged in Mathematics Achievement (F (2, 26) = 1.06, p = .36) and English Achievement (F (2, 26) = .68, p = .51) with regard to the NCCD levels of adjustments for students with disabilities. Findings also showed no statistically significant differences in the NCCD level of adjustments and the mean scores for Mathematics Self-concept (F (2, 26) = .76, p = .48), English Self-concept (F (2, 26) = .65, p = .53), and General School Self-concept (F (2, 26) = .22, p = .80). In terms of academic responsibility, no statistically significant differences were found between the mean scores of Internal Responsibility for Success (F (2, 26) = .30, p = .73) and Failure (F (2, 26) = .18, p = .83) across the NCCD levels of adjustments. Finally, findings demonstrated that there was no statistically significant difference between School Satisfaction and the NCCD levels of adjustments (F (2, 26) = .12, p = .88).

4.3. Chapter Summary

In this chapter, the quantitative data were analysed to provide empirical evidence of the relationship and discrepancies between academic achievement and academic wellbeing for Australian secondary students with and without disabilities. This evidence is used in Strand 2 of the study to investigate how academic achievement and academic wellbeing are related under adjusted situations for students with disabilities. Further, in this chapter, academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) were compared with regard to the NCCD levels of adjustments for students with disabilities.

Generally, findings, using Pearson’s correlation coefficients, showed that secondary school students with higher Mathematics and English outcomes perceived their mathematical and English capabilities more positively. In terms of academic responsibility, a weak but significant relationship was found between Mathematics

Achievement and Internal Responsibility for Success only, suggesting students with higher Mathematics outcomes were more likely to attribute academic success to themselves. However, English Achievement was unrelated to Internal Responsibility for Success and Failure. In the subscale of School Satisfaction, findings indicated that students were satisfied with school. A significant relationship was found between School Satisfaction and Mathematics Achievement but not for English Achievement.

Specifically, findings revealed that having a disability was related to lower academic achievement. For students without disabilities, Mathematics and English achievement were related to corresponding self-concepts. For students with disabilities, a significant association emerged between Mathematics Achievement and Mathematics Self-concept only. For each group of students, Mathematics and English Achievement were related to General School Self-concept. In terms of academic responsibility, Mathematics and English Achievement were not correlated to Internal Responsibility for Success and Failure for each group of students with and without disabilities. A significant relationship was found between Mathematics Achievement and School Satisfaction for students with disabilities only.

Research Question 2 of this study compared academic achievement and academic wellbeing between students with and without disabilities. Using an independent-samples t-test, findings indicated that Mathematics and English Achievement of students without disabilities were not only higher than those of students with disabilities, but students without disabilities also perceived their mathematical and English abilities more positively than peers with disabilities. Findings showed that students without disabilities were more inclined to take Internal Responsibility for Success and Failure than students with disabilities. Interestingly, both the participating students with and without disabilities tended to take more Internal Responsibility for Success than Failure. In the subscale of

School Satisfaction, no difference was found between the groups. Finally, there were no differences, using ANOVA, among students with disabilities in academic and attitudinal variables based on the NCCD levels of adjustments that they received at school.

These findings are discussed further in Chapter 7, Discussion, as framing information to examine findings with respect to Strand 2 of the study, the qualitative case studies undertaken to achieve an in-depth understanding of how assessment tasks and their adjustments for students with disabilities relate to academic achievement and academic wellbeing. In Chapter 5, the initial component of Strand 2 is reported, examining the nature of assessment adjustments undertaken for four case study students with different characteristics and extent of disabilities.

CHAPTER 5: Qualitative Case Studies — Strand 2

'Every child has a different learning style and pace. Each child is unique, not only capable of learning but also capable of succeeding'

Robert John Meehan

5.0. Overview

This chapter presents descriptions and findings for Strand 2 of this study which explored how enactment of inclusive education and principles of adjustments enables students with disabilities to participate in classroom assessment and demonstrate their knowledge and skills. It explored how academic achievement connects to provided adjustments in assessment for students with disabilities. The investigation comprised qualitative case studies of four students with disabilities. First, how the teachers adjusted the assessment tasks with regard to the learning challenges of the four individual students with disabilities is examined first. Second, the perceptions of the case study students, their parents and teachers are explored as to how the adjustments provided related to achievement outcomes in focus subject areas. The findings presented in this chapter address Research Question 4:

How does academic achievement relate to selected adjustments to classroom assessment for secondary students with disabilities?

In this strand of the study, as outlined in Chapter 3, data were obtained from two data sources. First, data collected for the ACAP was utilised. The ACAP database consists of two main components: *Survey Data* (student, parent, teacher); and *Student Assessment Data*. As noted in Chapter 3, a structured survey provided demographic data about the teachers of the case study students and their educational qualifications and experience.

Semi-structured surveys used open-ended questions to ask the stakeholders to describe the nature of student disabilities and their effects on assessment, and in particular, assessment adjustments that were made or were desirable, as well as their perceptions of the impacts of provided adjustments on the students' achievement in a specific subject area.

To give voice to the participants and provide the reader with a more accurate experience and perspectives of the stakeholders (students, parents, teachers), many direct passages from the surveys are included in the descriptions provided in this chapter. As noted in Chapter 3, the structured survey question options selected by participants are indicated by single quotation marks, and verbatim quotations from open-ended survey responses are indicated by double quotation marks.

Analysis of the Student Assessment Data included three components:

a) Identification of access and target skills using assessment artefacts, that is, the work unit or syllabus if provided, the grading schema or rubric, the assessment task information, and samples of the students' assessment work in the subject area of focus. Access skills are the knowledge and skills that students require to perform an assessment task but are not the intended assessment focus of the task. By contrast, target skills are the knowledge and skills that are intended to be assessed by a task, as evidenced by the curriculum goals and grading rubrics. Adequate levels of access skills allow the student's performance on the assessment to be most reflective of the targeted knowledge and skills (Dembitzer & Kettler, 2018). Lack of access skills may affect the validity of the assessment task for students with disabilities and interpretation of outcomes (Dembitzer & Kettler, 2018; Sireci, 2008).
b) information on adjustments made to the task for each case study student.

c) academic achievement using the case study student’s most recent Mathematics and English grades.

Analysis of data relating to students’ academic achievement is important for diagnostic and planning purposes in assessment (Wyatt-Smith et al., 2014), discussed further below.

As noted in Chapter 3, the four case study students were from Queensland and Victoria. In Queensland, student achievement was reported using the Queensland Curriculum & Assessment Authority (QCAA, 2020) Framework Standards for the case study students’ Year levels (A = very high level, B = high level, C = sound level, D = limited level, E = very limited). In Victoria, curriculum F(foundation)–10 is structured as a continuum across six levels (foundation, Ls 1-2, Ls 3-4, Ls 5-6, Ls 7-8, Ls 9-10) of learning achievement, not years of schooling. This is intended to enable the development of targeted learning programs for all students, where the curriculum is used to plan with respect to the identified learning level of each student rather than an assumed level of learning based on age (Victorian Curriculum and Assessment Authority [VCAA], 2020). Results for Victorian case study students are reported by Level.

The artefacts offered by all participating teachers showed that the assessment tasks were approved for implementation by the relevant Heads of Department. Government schools are provided with guidance and resources by state education authorities (see, e.g., Department of Education, 2020b; Department of Education and Training (Victoria), 2020). Non-government schools must submit curriculum plans that demonstrate implementation of the Australian Curriculum in learning areas and outcomes, as well as how the school will differentiate and provide adjustments to address students’ learning needs (Non-State School Accreditation Board (Queensland), 2020). The level of approval for the assessment tasks completed by the focus students are therefore aligned with, and reflect the learning priorities of, the jurisdictional authority and Australian Curriculum. This addresses core validity issues raised by Tomlinson and Moon (2013).

To determine the validity of assessment grades under an adjusted situation, three further questions were addressed (Sireci, 2008): (a) did the provision of adjustments alter target skills of assessment? If so, how? (b) did the provision of adjustments improve the measurement of the student's knowledge and abilities? If so, how? (c) was the student's grade from adjusted assessment comparable to grades of students without disabilities under unchanged assessment?

Table 5.1 provides a summary overview of information about each case study student, Alfie, Liam, Daniel, and Leo, as well as their educational contexts. The students studied in Years 7 through 9 and attended mainstream secondary schools at the time of data collection. The age of the case study students ranged from 12 to 15. Table 5.1 shows the students were drawn from a range of inclusive educational contexts. As noted, descriptions of the nature of participating students' disabilities are compiled from parent, student and teacher survey responses. Of the four case study students, two students, Daniel and Alfie, were identified as having medical conditions. Characteristics identified in the literature as related to the case study students' disabilities are also presented in Table 5.2. Each student is described under the following subheadings:

- Context of schooling
- The nature of student disabilities and reported impact
- Stakeholders' perspectives about classroom assessment adjustments
- Student classroom assessment task and adjustments

Table 5. 1

Case Study Students: An Overview

Case study	Year Level	Age Year/ month	The nature of disabilities	Sex	School type	School sector	Location	State
Alfie	9	14/4	Specific Learning Impairment (Dysgraphia)	Male	Secondary	G	Metropolitan	Qld
Liam	8	13/7	Autism Spectrum Disorder	Male	Combined	N-G	Metropolitan	Qld
Daniel	9	15	Autism Spectrum Disorder, ADHD, Specific Learning Impairment, Language impairment	Male	Secondary	N-G	Metropolitan	Vic
Leo	7	12/8	Specific Language Impairment, Auditory Processing Disorder (APD)	Male	Secondary	G	Metropolitan	Qld

Note. ADHD: Attention Deficit Hyperactivity Disorder; G: Government; N-G: Non-Government; Vic: Victoria; Qld: Queensland

Table 5. 2

Characteristics associated with the Participating Case Study Students' Disabilities

Nature of disabilities	Characteristics
Specific Language Impairment (SLI)	SLI is identified as a delay in the mastery of language skills that affect the development of speaking and listening skills in children who have no hearing loss or intellectual disabilities (National Institutes of Health, National Institute on Deafness and Other Communication Disorders [NIDCD], 2019).
Auditory Processing Disorder (APD)	APD is a dysfunction in processing of auditory information, despite having normal hearing thresholds (National Institutes of Health, National Institute on Deafness and Other Communication Disorders [NIDCD], 2019).
Dysgraphia	Dysgraphia is a specific learning disorder with impairment in written expression (Diagnostic and Statistical Manual of Mental Disorders [DSM-5]: American Psychiatric Association [APA], 2013).
Autism Spectrum Disorder (ASD)	ASD is a common neurodevelopmental disorder, identified through deficits in two main domains: social communication/interaction and restrictive, repetitive patterns of behaviour (DSM-5: APA, 2013).
Attention Deficit Hyperactivity Disorder (ADHD)	ADHD is a neurodevelopmental disorder that includes a combination of persistent problems such as trouble sustaining attention, hyperactivity and impulsive behaviours (DSM-5: APA, 2013).

5.1. The Case of Alfie

5.1.1. Context of Schooling

At the time of the study, Alfie was a 14-year-old male in Year 9 in a government high school in a metropolitan region in Queensland. Boys were a slight majority of enrolments in the school (60%). The school's ICSEA[7] identified the level of socio-educational advantage as average in comparison with other Australian schools (www.myschool.edu.au). The school's inclusive education policy as stated on its website noted that students with disabilities were provided with educational adjustments intended to support them to fully access and participate in learning programs 'on the same basis' as their peers. This declared position reflected a whole-school commitment to inclusive schooling practices (Retrieved from the school website).

The focus of assessment in Alfie's case study was Mathematics, in a class[8] of 27 students. Alfie's mathematics teacher was a female aged between 25 to 34 years old with a bachelor with Honours' degree non-teaching qualification and a diploma teaching qualification. She was a full-time teacher who had taught Years 7 to 12 mathematics and sciences for two years. Alfie's teacher reported that mathematics classes in the school were grouped by student ability: excel, extension, core and foundation. Alfie was placed in a core class. No information was provided by the teacher about how decisions were made to place students in the different groups and the nature of those categories. However, by inference from the terminology, the 'foundation' group would appear to receive the most basic mathematics content and conversely the 'excel' group would be working at the most

[7] . Index of Community Socio-Educational Advantage, sourced from MySchool Website (https://www.myschool.edu.au/).

[8] . Recommended class sizes are 28 students for Years 4 through to 10 in Australia (Department of Education, 2020b).

academically-demanding level. The teacher stated that the core teachers worked together to write examinations and assignments that were then approved by the Head of Department. The context of Alfie's schooling therefore indicates that he has a relatively new teacher, but one supported by colleagues to develop assessments.

5.1.2. The Nature of Alfie's Disabilities and Reported Impact

Alfie, his mother, and teacher reported that Alfie was diagnosed with *dysgraphia*. In the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM–5; American Psychiatric Association, 2013), dysgraphia is a neurological disorder, referred to as a specific learning disorder resulting in impairment in *written* expression. Individuals with dysgraphia have a prominent impairment in fine motor skills as well as difficulties producing written forms (Biotteau et al., 2019), which, in turn, can impact the development of handwriting and spelling skills (Berninger et al., 2015). This official diagnosis of Alfie's disabilities resulted in additional specific funding to meet his educational needs[9].

Overall, Alfie's teacher indicated she had received information about Alfie's disabilities from various sources (e.g., school, parents). Within the school, Alfie's teacher reported that she was informed about Alfie's disabilities through an email sent to her by the "case manager"[10] of students with disabilities at the beginning of the school year. A case manager is responsible for ensuring services in an Education Adjustment Program (EAP) are being provided. The teacher added that the email contained a description of the student's disabilities as well as a list of "reasonable" adjustments that had to be provided

9 . Although information about provision of additional funding to the school for a specific student is noted, schools do not disclose how such funds are used to support the student.

10 . Double quotation marks indicate verbatim quotes from survey responses.

for the individual students with disabilities within the classroom. The teacher pointed out that she discussed Alfie’s disabilities with him and his mother at a parent-teacher interview session. Such sessions are frequently brief, with teachers meeting parents of all students in the class in a restricted time.

As described by Alfie’s mother, Alfie had difficulties with handwriting and using accurate spelling and punctuation marks at the expected level for his age. Although Alfie did not explicitly mention his difficulties with spelling, his survey responses had numerous spelling mistakes, discussed below. Difficulty with overall coherence in writing was another problem that Alfie experienced. Alfie’s teacher said, “I understand that [Alfie] has difficulty taking the information from his head and writing it on a page in that his process takes longer than usual and can result in incoherent/unclear writing”.

As reported by Alfie’s mother and teacher, Alfie also had trouble drawing curves and graphs in mathematics tasks. The teacher reported that Alfie had a medical problem, migraine headaches, that had caused him to miss “a lot of his classes”. She reported that she provided Alfie and his mother with “a copy of a unit plan with all of the topics and their relevant chapters and textbook questions for [Alfie] to refer to if he was away”. Neither Alfie nor his mother mentioned migraine headaches or absences in their survey responses. As can be seen in Table 5.3, characteristics of the student’s disabilities that have been described by Alfie’s teacher are all evidence of dysgraphia, indicating that she had an understanding of the student’s educational needs. In comparison to the more personal description of Alfie’s disabilities provided by Alfie’s mother, the teacher has provided a more comprehensive representation of the difficulties that the student faced within the classroom. Difficulties in writing, spelling and achieving overall coherence in writing presented academic barriers to both success and learning.

Table 5. 3

Characteristics of Alfie's Disabilities Reported by Stakeholders in Surveys

Characteristics of Alfie's disabilities	Alfie	Mother	Teacher
Dysgraphia	✓	✓	✓
Use of accurate spelling and punctuation marks	-	✓	-
Difficulty with coherent writing	-	-	✓
Difficulty with drawing curves and graphs		✓	✓
Migraine headaches	-	-	✓

Based on Alfie's own written survey responses, the evidence shows that the nature of Alfie's disabilities affected the academic aspects of his schooling. Alfie believed his educational performance had been affected "in every way" due to limitations resulting from his disabilities. Alfie said, "i has haperd my ablity to compleat in calss assments with out the help form an external sourc". As can be seen in the sentence typed by Alfie, of 17 words, there were eight misspellings, reflecting his *severe* difficulties with spelling. By contrast, the response shows that he has a well-developed vocabulary, but might be limited in his capacity to communicate his intended meaning in assessment tasks, especially hand-written and within specified time limits.

5.1.3. Stakeholders' Perspectives about Classroom Assessment Adjustments

To increase accessibility of instruction and assessment, Alfie was provided with adjustments that enabled him to participate in and complete daily classroom activities. In the following, the perspectives of Alfie, his mother and teacher about the adjustments that had been made for Alfie, as well as the challenges that they faced, are discussed.

In the instructional context, as reported by Alfie's mother and teacher, Alfie was permitted to take pictures of the classroom boards using his mobile phone. Further, he had access to a laptop to type his classroom notes and undertake activities. Alfie's teacher commented, "[Alfie]'s notes on the laptop often had many typos, and sometimes his answers and notes were difficult to follow". Therefore, Alfie was identified by the school as eligible to access a scribe in assessment contexts. The scribe's *familiarity with the subject* was an important point discussed by Alfie, his mother and teacher. Given that each subject area has its own discipline-based terminology (Wyatt-Smith & Cumming, 2003), a scribe's unfamiliarity with the special terms being used in an examination could lead to repeated stops as the scribe requires more clarification for the terms.

In Term 1, as reported by the teacher, Alfie's scribe for the Mathematics assessment was a "teacher aide" who did not have familiarity with mathematical symbols as used in the official curriculum. Therefore, when Alfie verbalised his answers to the scribe, he had to describe symbols explicitly as well. For example, instead of saying theta (θ), Alfie had to say, "draw an oval with a line through the middle". In the Term 1 Mathematics assessment task, although students were asked to 'show all working' on their paper (see Figure 5.1), Alfie's paper shows that the process of solving the problems using formulae was not fully expanded in writing (Figure 5.2).

Figure 5. 1

The First Page of the Mathematics Assessment Task Sheet, Term 1

Rates, Linear functions & Surface area and volume

STUDENT NAME			
TEACHERS			
DATE GIVEN	Term 1 Week 9	TIME	60 minutes

INSTRUCTIONS
Answer all questions on this paper, in the space provided. **Show all working**.

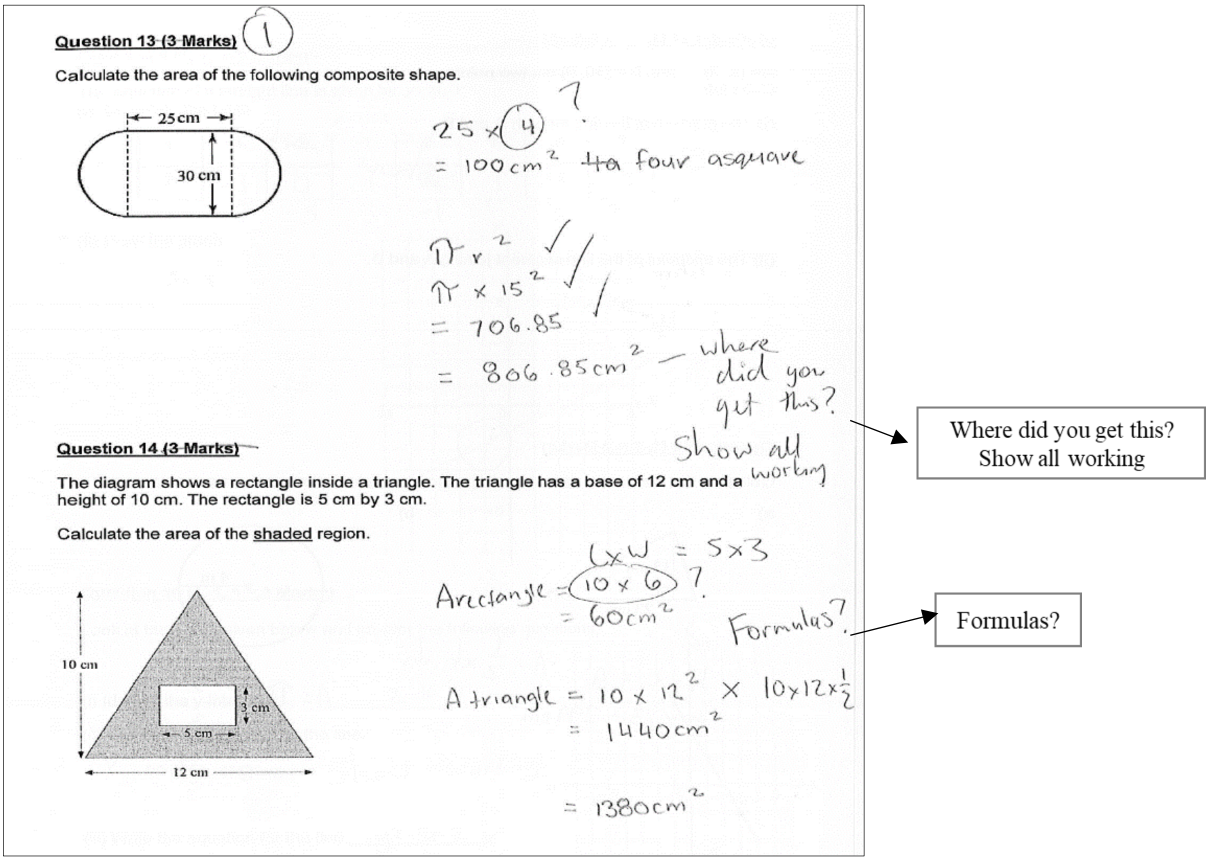
Fluency and understanding	
Fluency • be able to identify and simplify rates and ratios • demonstrate skill in using rates • use scale factors for pairs of similar figures	**Understanding** • apply direct proportion to real life contexts • write algebraic rules to describe patterns
Reasoning and Problem Solving	
Reasoning • follow mathematical arguments and drawing conclusions based on mathematical calculations.	**Problem solving** • solve word problems involving simple rates and present data in different formats

Standards

Fluency and Understanding	Reasoning and Problem Solving	Communication	Overall
$7\frac{1}{2}$ /32 E+	$2\frac{1}{2}$ /9 D		10 /41 D-

Figure 5. 2

The Sample of Responses Written by the Untrained Scribe in the Mathematics Assessment Task, Term 1



Alfie’s teacher reported that there was a considerable difference between how she perceived Alfie’s “true” ability and his achievement outcome (D-) in Mathematics in the Term 1 task. Similarly, Alfie’s mother reported that, in a meeting with the mathematics teacher, the teacher had said, “[Alfie] understands all the work, puts his hand up in class and answers the questions correctly, and correctly finishes the homework”. However, Alfie’s mother stated that Alfie achieved a D in the Mathematics assessment task, which was “very disheartening” for him. Therefore, the teacher discussed this outcome with Alfie, his mother and his case manager. The teacher noticed, based on Alfie’s and his mother’s report, that the same issue had occurred in his humanities class, where a “huge difference" occurred in the nature and extent of Alfie's responses when scribed by a teacher aide without humanities knowledge and those written by the humanities teacher. Given the problems resulting from the scribe's unfamiliarity with mathematics in Term 1, the teacher suggested that Alfie should have access to a teacher aide who was a "former mathematics teacher" as the scribe for the Term 2 assessment. Hence the teacher arranged with the Head of Special Education Services (HOSES) for this teacher aide to be Alfie's scribe.

Overall, from the perspectives of Alfie, his mother and teacher, the main issue in providing effective adjustments was a scribe's familiarity with the specific subject area. Taking pictures of the classroom board, use of a laptop to take notes and having access to a copy of a unit plan and textbook questions were reported as instructional adjustments that were provided for Alfie within the classroom. However, in classroom assessment tasks, Alfie could access a scribe only. In the following, the influential role of a scribe with a background in mathematics in the improvement of Alfie's Mathematics outcome is discussed.

5.1.4. The Student's Focus Mathematics Assessment Task and Adjustments

Figures 5.1, 5.3, and 5.4 show the alignment of the assessment tasks completed by Alfie and his fellow students with the focuses of the Year 9 mathematical curriculum expectations overall (Figure 5.3) and the task requirements (Figures 5.1, 5.4).

Access and target skills: The ability to read and comprehend assessment questions and write responses are prerequisite skills required to complete the tasks. However, Alfie had functional impairments in writing skills (e.g., handwriting, spelling, using coherent text), limiting him from completing the task. The target skills, shown in

Figure 5.3, to be assessed by the summative Mathematics task, ‘Algebra; Linear Equations; Similarity’, included two main elements:

> (i) *understanding and fluency:* (a) conceptual understanding (i.e., conception and description of mathematical concepts), (b) procedural fluency (i.e., use of facts and procedures to find solutions), and (c) mathematical language and symbols (i.e., use of mathematical terminology, diagrams and symbols).
>
> (ii) *problem solving and reasoning:* (a) problem-solving approaches (i.e., application of problem-solving approaches to investigate unfamiliar situations), (b) mathematical modelling (development of mathematical models and representations in unfamiliar situations), and (c) reasoning and justification (i.e., explanation of reasoning for the logic of choices made).

The important assessment elements therefore are on mathematical knowledge and expression, and reasoning (Tomlinson & Moon, 2013), not quality of writing or spelling.

Figure 5. 3

Year 9 Mathematics Assessment Task Grading Rubric and Target Skills

		The folio of a student's work has the following characteristics:				
Understanding and fluency	Conceptual understanding	connection and description of mathematical concepts and relationships in unfamiliar situations	connection and description of mathematical concepts and relationships in complex familiar situations	recognition and identification of mathematical concepts and relationships in simple familiar situations	some identification of simple mathematical concepts	statements about obvious mathematical concepts
	Procedural fluency	recall and use of facts, definitions, technologies, and procedures to find solutions in unfamiliar situations	recall and use of facts, definitions, technologies, and procedures to find solutions in complex familiar situations	recall and use of facts, definitions, technologies, and procedures to find solutions in simple familiar situations	some recall and use of facts, definitions, technologies, and simple procedures	partial recall of facts, definitions, or simple procedures
	Mathematical language and symbols	effective and clear use of appropriate mathematical terminology, diagrams, conventions, and symbols	consistent use of appropriate mathematical terminology, diagrams, conventions, and symbols	use of appropriate mathematical terminology, diagrams, conventions, and symbols	use of aspects of mathematical terminology, diagrams, and symbols	use of everyday language
Problem-solving and reasoning	Problem-solving approaches	systematic application of relevant problem-solving approaches to investigate unfamiliar situations	application of relevant problem-solving approaches to investigate complex familiar situations	application of problem-solving approaches to investigate simple familiar situations	some selection and application of problem-solving approaches in simple familiar situations	partial selection of problem-solving approaches
	Mathematical modelling	development of mathematical models and representations in unfamiliar situations	development of mathematical models and representations in complex familiar situations	development of mathematical models and representations in simple familiar situations	statements about simple mathematical models and representations	isolated statements about given mathematical models and representations
	Reasoning and justification	clear explanation of mathematical thinking and reasoning, including logical justification of choices made, evaluation of strategies used, and conclusions reached	explanation of mathematical thinking and reasoning, including reasons for choices made, strategies used, and conclusions reached	description of mathematical thinking and reasoning, including discussion of choices made, strategies used, and conclusions reached	statements about choices made, strategies used, and conclusions reached	isolated statements about given strategies or conclusions

Adjustments made for the Mathematics assessment task: As previously mentioned, Alfie had difficulties with writing and graphical skills, which are all access skills required to perform the Mathematics assessment task. According to the reports of Alfie, his mother and teacher, the nature of the summative assessment task for Alfie was not different from the task for the rest of the class. However, Alfie was permitted to access assessment adjustments. Alfie, his mother, and teacher reported that a scribe recorded Alfie's responses to the task. Furthermore, the teacher stated that Alfie and his scribe were seated in a different place for the examination, and extra time was permitted to accommodate the use of a scribe. Other students were asked to answer the questions in 60 minutes and handwrite their responses (Figure 5.4). Samples of responses written by the scribe are shown in Figures 5.5 and 5.6.

Alfie's mathematics achievement: The teacher implemented an A to E grading rubric to assign a grade to the student's assessment (Figure 5.3). Alfie achieved A+ in 'Fluency and Understanding' (Figure 5.4), which indicated he factorised algebraic expressions effectively and solved linear equations with step-by-step working. Additionally, Alfie's work sample showed that he defined the mathematical terms in the task. Alfie achieved A- in the domain of 'Reasoning and Problem solving' (Figure 5.4), which demonstrated he provided reasons for conclusions reached. Alfie demonstrated a systematic problem-solving approach to analyse the problem and derive the solution for Question 10 (Figure 5.3). Alfie achieved an A in Mathematics overall. Alfie reported in his survey that he was 'very confident' about his Mathematics achievement, confirmed by his Mathematics outcome. Overall, according to the Australian Curriculum in Queensland (QCAA, 2020), Alfie has worked at a very high level of knowledge and understanding of Year 9 mathematics.

Figure 5. 3

The First Page of the Mathematics Assessment Task Sheet, Term 2

Algebra; Linear Equations; Similarity

STUDENT NAME			
TEACHERS			
DATE GIVEN	Week 10	**TIME**	60 minutes

INSTRUCTIONS
1. Answer all questions on this paper, in the space provided. **Show all working.** 2. Scientific calculators may be used.

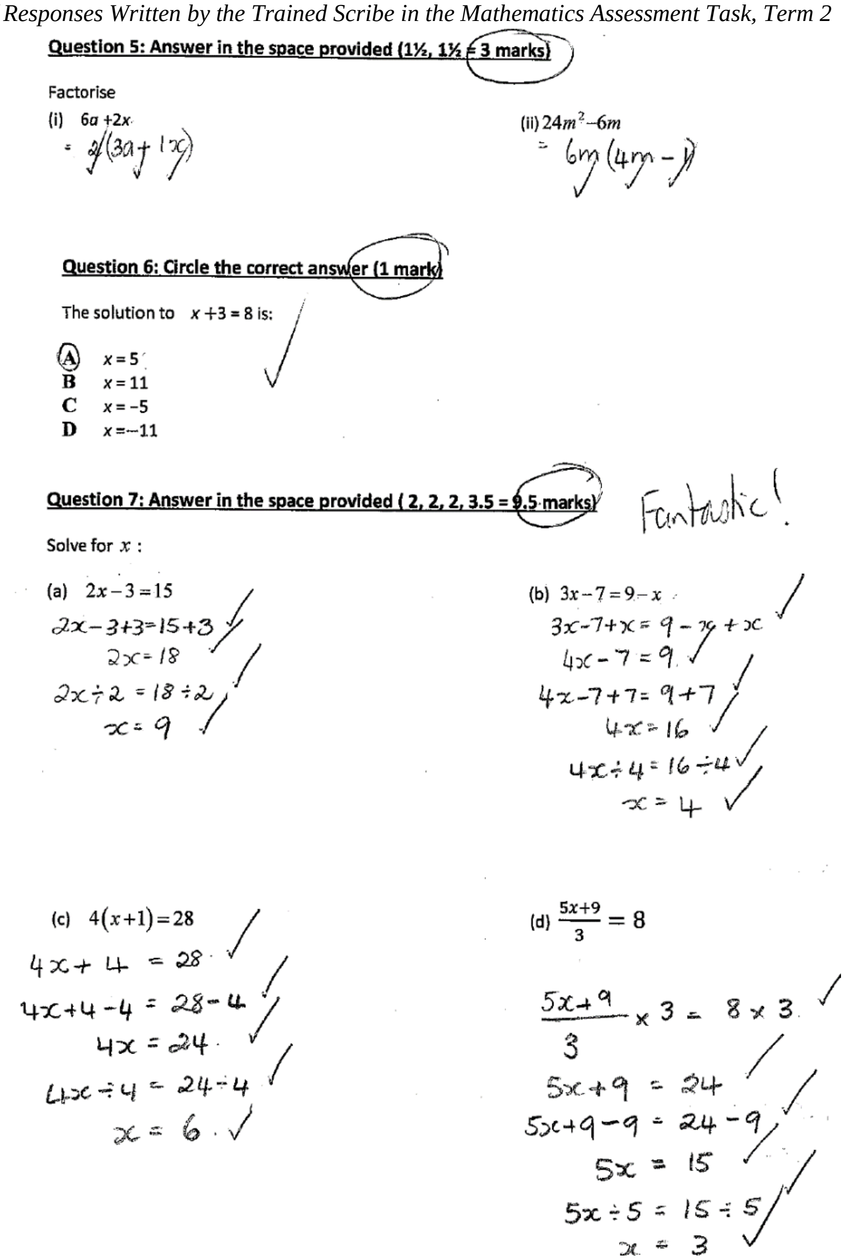
Fluency and Understanding
• expand, simplify and factorise algebraic expressions • solve linear equations • use scale factors for pairs of similar figures
Reasoning and Problem Solving
• follow mathematical arguments and drawing conclusions based on mathematical calculations. • using algebraic to techniques find solutions to linear equations • describe linear rules using both words and algebra • formulating, and modelling practical situations involving ratio and scale factors to similar figures

Standards

Fluency and Understanding	Reasoning and Problem Solving	Overall
24 **/25** A+	6.5 **/9** A–	A Well done

Figure 5. 4

Sample of Responses Written by the Trained Scribe in the Mathematics Assessment Task, Term 2



Question 5: Answer in the space provided (1½, 1½ = 3 marks)

Factorise

(i) $6a + 2x$

$= 2(3a + 1x)$ ✓ ✓

(ii) $24m^2 - 6m$

$= 6m(4m - 1)$ ✓ ✓ ✓

Question 6: Circle the correct answer (1 mark)

The solution to $x + 3 = 8$ is:

A $x = 5$ ✓

B $x = 11$

C $x = -5$

D $x = -11$

Question 7: Answer in the space provided (2, 2, 2, 3.5 = 9.5 marks) Fantastic!

Solve for x :

(a) $2x - 3 = 15$

$2x - 3 + 3 = 15 + 3$ ✓

$2x = 18$ ✓

$2x \div 2 = 18 \div 2$ ✓

$x = 9$ ✓

(b) $3x - 7 = 9 - x$ ✓

$3x - 7 + x = 9 - x + x$

$4x - 7 = 9$ ✓

$4x - 7 + 7 = 9 + 7$ ✓

$4x = 16$ ✓

$4x \div 4 = 16 \div 4$ ✓

$x = 4$ ✓

(c) $4(x+1) = 28$ ✓

$4x + 4 = 28$ ✓

$4x + 4 - 4 = 28 - 4$ ✓

$4x = 24$ ✓

$4x \div 4 = 24 \div 4$ ✓

$x = 6$ ✓

(d) $\frac{5x+9}{3} = 8$

$\frac{5x+9}{3} \times 3 = 8 \times 3$ ✓

$5x + 9 = 24$ ✓

$5x + 9 - 9 = 24 - 9$ ✓

$5x = 15$ ✓

$5x \div 5 = 15 \div 5$ ✓

$x = 3$ ✓

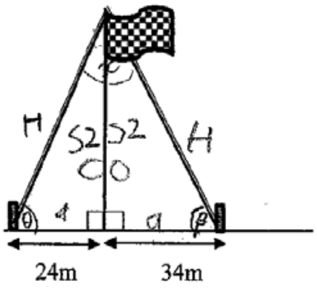
Figure 5. 5

Sample of Responses Written by the Trained Scribe in the Mathematics Assessment Task, Term 2

Reasoning and Problem Solving

__Question 10 (4 Marks)__

The ends of two ropes are tied to the top of a vertical flagpole of height 52 m. The ropes are pulled tight and attached to two stakes on the ground as shown in the diagram. The distances of the stakes from the base of the flag pole are 24 m and 34 m respectively.



Calculate the ***angle between the two ropes.***

$\tan\theta = \frac{opp}{adj}$ ✓

$= \frac{52}{24}$ ✓

$\theta = \tan^{-1}(2.16)$

$= 65.15^\circ$ ✓

$\tan\beta = \frac{opp}{adj}$ ✓

$= \frac{52}{34}$

$\beta = \tan^{-1}(1.52)$

$= 56.65^\circ$ ✓

Triangle = 180°

$65.15^\circ + 56.65^\circ + x = 180^\circ$ ✓

$x = 180^\circ - 121.8^\circ$

$= 58.2^\circ$ ✓

The angle between the two ropes is 58.2°. ✓

Stakeholders’ reflections on the provision of adjustments: The available evidence, as discussed by Alfie’s teacher, showed that the adjustments provided to address Alfie’s access skills had positive effects not only on Alfie’s *success* in Mathematics but also on his perception of self. The teacher noted that when a scribe with mathematical knowledge wrote down Alfie’s dictated responses in the Mathematics task, Alfie achieved an A. Alfie no longer needed to explain mathematical terms and symbols to his scribe. The teacher remarked that the access to the knowledgeable scribe enabled Alfie to concentrate better on the questions and content of the Mathematics assessment task. The teacher stated that Alfie told her after the assessment that he felt “very positive” and that it was easier to work with the scribe with mathematical knowledge than his previous scribe. Alfie’s mother said access to this scribe in Mathematics was an appropriate adjustment that “absolutely” enabled Alfie to demonstrate his “full potential” in Mathematics. Overall, Alfie and his mother’s survey responses about the type of adjustments made under Mathematics assessment aligned with adjustments (a trained scribe, extra time, a different place for the assessment) that Alfie’s teacher mentioned in her written reports.

Validity of adjustments to the classroom assessment: Alfie completed the same assessment task as other students. Therefore, the adjustments provided for Alfie did not alter the elements of the target skills that were to be assessed (Sireci, 2008) but were implemented to address his difficulties with the access skills of writing his responses. Alfie was provided with extra time, as dictating takes longer than writing, and completed his assessment in a separate location to avoid distracting other students.

For this assessment task, therefore, the implemented adjustments, through removing barriers relating to access skills, made the task more accessible to Alfie and improved the measurement of his knowledge and abilities (Sireci, 2008). For Alfie, the teacher reported considerable evidence that the final assessment with the appropriately experienced scribe was reflective of Alfie's standard of knowledge. Therefore, the adjustments increased the assessment validity. While many students may benefit from extra time, Sireci's third proposition of comparability, the extra time provided to Alfie was required for dictating, not reasoning. The use of the same rubric grading for Alfie's work as for other students, and the focus on objectively scored elements, meant that his adjusted assessment grade was comparable to the results for other students (Sireci, 2008). Overall, the provision of the adjustment in the form of an appropriate scribe for Alfie was both necessary and effective.

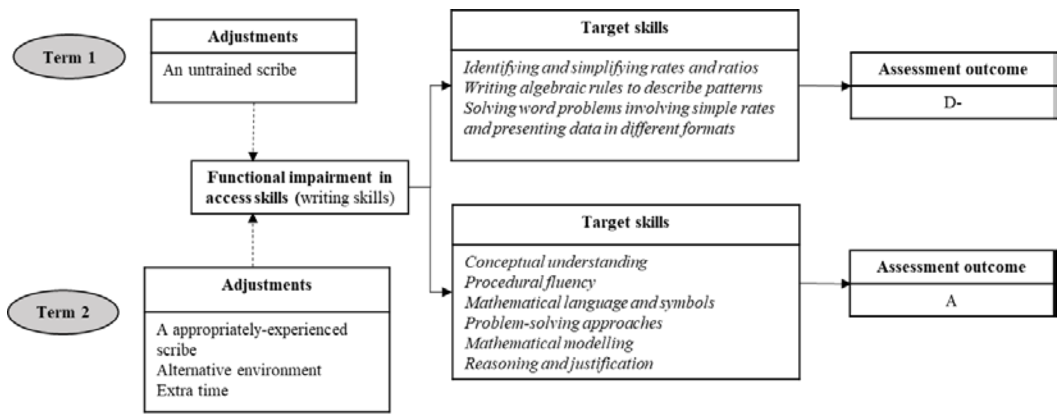
5.1.5. Summary of the Case

The findings of this case study showed the experiences of a student with dysgraphia who was provided with both *inappropriate* and *appropriate*, but similar in intent, adjustments in the Mathematics summative assessments. The available evidence showed Alfie's disability, dysgraphia, would have affected his access skills if he had been required to complete the task on the same basis as other students, that is, hand-written and graphical skills for writing symbols. Insufficient levels of the access skills for the assessments made Alfie eligible to have a scribe in the Mathematics assessment, but the assessment content was not adjusted as Alfie had an adequate level of the mathematical competence, that is, the target knowledge.

According to the reports of Alfie's teacher and mother, the extent of a scribe's familiarity with mathematical terms and concepts led to a considerable difference between the assessment score (D-) and Alfie's "true" abilities in Mathematics in Term 1and his responses to the task in Term 2, and an overall A grade. Although different mathematical target skills were measured in the Terms 1 and 2 Mathematics assessment tasks, overall, the teacher considered that the results in Term 1 did not reflect Alfie's mathematical skills and knowledge. A differential score boost (Sireci et al., 2005) was an identifiable effect related to the appropriately-experienced scribe for this case study student (see Figure 5.7). Furthermore, the adjustment provided, that is, the use of a knowledgeable scribe, did not affect the validity of the task in terms of target skills.

Figure 5. 6

Access and Target Skills, the Adjustments and Final Results of Mathematics Assessment in Terms 1 and 2



5.2. The Case of Liam

5.2.1. Context of Schooling

At the time of the study, Liam was a 13-year-old student in Year 8 attending a private school (Preparatory Year to Year 12) in a metropolitan region in Queensland, with boys comprising 45% of enrolment. The school's ICSEA showed that the level of socio-educational advantage was average for this school compared with other Australian schools (www.myschool.edu.au). Liam's school's website showed that the school was committed to providing an inclusive learning environment, attempting to recognise the needs of each student with and without disabilities and promoting their personal capabilities (Retrieved from school website).

The focus of assessment in Liam's case was a Mathematics assignment completed over six lessons and five weeks in class. Liam's teacher was male, aged between 45 to 54 years with a bachelor's degree teaching qualification. He was a full-time teacher who had taught mathematics, sciences and agriculture to students in Years 7 to 12 for over 15 years. At the time of this study, Liam's teacher taught mathematics and had 28 students in his class. The teacher stated that Liam had been identified through school processes, not elaborated, as a "gifted student" who participated in "the school's Gifted Education Program". The teacher reported that he was informed about Liam's educational status through the "Learning Enrichment Department", and discussions with the student, his parents, teacher aide, school leader, and learning support staff. The teacher said that he was supported by "learning intervention teacher/aides" in order to ensure appropriate support to meet Liam's individual needs in Mathematics. Overall, this evidence denotes that Liam's teacher was a well-experienced teacher whose understanding of the student's learning needs was derived through various sources.

5.2.2. The Nature of Liam's Disabilities and Reported Impact

Liam and his teacher also reported that Liam had been identified as having *Autism Spectrum Disorder* (ASD). Liam stated that he was on the "milder end of autism spectrum disorder". Liam's mother also reported that Liam had "Asperger Syndrome". In Australia, approximately 63% of students with autism spectrum disorder attend mainstream schools (Australian Bureau of Statistics [ABS], 2018). Most of these students face educational barriers that often relate to communication, social and learning difficulties (Saggers et al., 2018). For example, they may show deficits in nonverbal communication (e.g., lack of or minimal eye contact), may be unable to understand social cues and may not socialise with peers. Repetitive behaviours (e.g., spinning objects, echolalic responses), resistance to change, fixated interests and unusual reactivity to sensory input (e.g., adverse reactions to specific sounds) are often common characteristics of autism spectrum disorder (American Psychiatric Association [APA], 2013; Carrington et al., 2014), Again, this official diagnosis of Liam's disabilities resulted in additional specific funding to the school to meet his academic and social needs.

Poor handwriting skills was another problem that was discussed by Liam, his mother, and the teacher. Liam's mother reported that Liam "sometimes has very messy handwriting". Liam stated that he "sometimes typed larger pieces of work due to handwriting", but it was unnecessary for most "shorter pieces of work" because his handwriting was "readable enough" for the teacher. Liam added that his handwriting skills have "significantly" improved and, therefore, he did not have "many special needs". Liam and his teacher mentioned that Liam also had *speech delay*. For example, Liam's teacher said that Liam has had difficulties in “some spoken communication” skills. However, Liam’s mother did not note Liam’s language difficulty. Liam believed that difficulty in language skills did not interfere with his abilities to undertake mathematical tasks because he “rarely needed to speak in front of the class” as a component of assessment tasks. In general, the reports of Liam and his teacher about Liam’s disabilities strongly aligned, showing shared understanding around the nature of Liam’s disabilities (Table 5.4).

Table 5. 4

Characteristics of Liam’s disabilities Reported by Stakeholders in Surveys

Characteristics of Liam’s disabilities	Liam	Teacher	Mother
Autism spectrum disorder	✓	✓	✓
Poor handwriting skill	✓	✓	✓
Speech and language delay	✓	✓	-

However, Liam, his mother, and teacher also reported that Liam was a *gifted* student, often referred to as a twice-exceptional student (Townend & Pendergast, 2015). Liam’s mother stated that Liam had been able to understand Mathematics well and achieved “very good marks academically” and, therefore, Liam’s problems had not limited him in reaching his potential. Liam’s teacher said that “the student’s advanced abilities” in Mathematics presented “some limited challenges when working with the student within the daily classroom setting”. Overall, it seems that the impacts of Liam’s disabilities on his mathematical abilities following assessments adjustments have been reported to be negligible.

5.2.3. Stakeholders' Perspectives about Classroom Assessment Adjustments

From the perspectives of Liam and his mother, Liam's difficulty with handwriting was the main reason for the provision of the classroom adjustments. Liam reported that, in "Junior School", when his handwriting was "more unreadable", he was able to type his tasks. He also had been given "more writing space on some assessments (1/2 page of writing space vs 2 or 3 lines)". However, at the time of the study, Liam stated there were not any serious issues that prevented him from learning. Further, Liam reported, "typing longer assessments was usually standard for all students, so there were no adjustments there". He added that most of the adjustments provided for him were related to the level of "work difficulty". Liam's mother pointed out that Liam was "allowed to do assessments on computer or on paper with double-spaced lines" due to "very messy handwriting". Furthermore, Liam's mother stated,

> I would like my child to be treated the same as the other students as much as possible unless it is needed. As my child gets older, I would like to avoid the appearance of difference. As my child approaches adulthood, I would like them to be able to be in a workplace without being treated differently in case it prejudices their opportunities.

From the perspective of Liam's teacher, the focus of the adjustments for Liam was to "extend activities to allow the student to carry out mathematical investigations and to allow demonstrations of deeper investigations and understandings". The teacher stated that he considered "the priorities of the students on the learning activity or assessment items" when providing adjustments in the classroom. The adjustments provided in practice to Liam for the Mathematics summative assessment are described below.

5.2.4. Liam's Focus Mathematics Assessment Task and Adjustments

The assessment artefacts provided for Liam included the task completed by other students in the classroom (Figures 5.8 and 5.9) and grading rubric (Figure 5.11). Liam's task response is shown in Figure 5.10.

Access and target skills: The ability to read and comprehend assessment questions and write responses are prerequisite access skills required to complete the Mathematics task under the unadjusted condition. The text incorporated English descriptions to contextualise the task in everyday life as well as mathematical terms. The target skills in the Mathematics task, 'Perimeter and Area', included: (a) identification of a pattern between the different shapes in the context of the problem, (b) investigation of which of the shapes, an equilateral triangle, a square, a regular hexagon, a circle, had the largest area and extrapolation to a different length, (c) investigation of the relationship between features of circles such as circumference and diameter, (d) use of appropriate formulas to solve problem involving, and (e) the selection of appropriate units of measurement for area and change from one unit to another (see Figure 5.9 and Figure 5.11). Written guidance on completing the task were limited ("best effort"; "neatest submission") although clarity of handwriting and language may only have had impact on the fourth stage of task response, that the response should be "clear and well-organised".

Figure 5. 7

The Mathematics Assessment Questions

Scenario

When tidying your room one day, you come across a piece of string. It is such an exciting piece of string that you take a break from tidying to play with it. You lay it down on your desk and, one at a time, make the following shapes using the entire length of the string.

Equilateral triangle
Square
Regular hexagon
Circle

1. Which shape contains the largest area?

2. Is this always true? Try it with a different length of string.

3. Can you see a pattern? Explain what you observed. Where would other regular polygons fit in your pattern?

Figure 5. 8

The First Page of the Mathematics Assessment Task Sheet and Target Skills

YEAR 8 MATHEMATICS
Term 3 2018

String Assignment

Topic: Perimeter and Area

Australian Curriculum Elements	
ACMMG196	Find perimeters and areas of parallelograms, trapeziums, rhombuses and kites
ACMMG197	Investigate the relationship between features of circles such as circumference, area, radius and diameter. Use formulas to solve problems involving circumference and area.
ACMMG195	Choose appropriate units of measurement for area and volume and convert from one unit to another.

Instructions:

1. Give your very best effort in all steps of the investigation.
2. Hand in the very neatest submission that you can.

STUDENT'S NAME: ______________________

TEACHER'S NAME: ______________________

Problem Solving and Reasoning
/20

Adjustments to the Mathematics assessment task: According to the survey responses of Liam and his teacher, Liam's Mathematics task was assessed differently from the rest of the classroom students. In response to the question of how the task has been adjusted, Liam stated, "for the written assessment, I did an *extension task*. Instead of calculating three samples by hand, I created an *Excel* spreadsheet that could calculate many more samples at once." As shown in Figure 5.10, Liam's remark in his answer sheet that he used Excel to solve the problem, confirmed this. Through use of computer simulation, therefore, Liam extrapolated the task to 50 randomly-generated lengths, extended the range of regular hexagons to five forms, created formulae in Excel, and did his calculations. He also reflected on his process. Liam's teacher stated, "assessment items were adjusted in order to facilitate an organised and ample space for written responses".

Although Liam undertook an extension task, the same grading rubric was used to assign a grade as for other students (see Figure 5.11). The rubric divides the task into four stages. The unadjusted expectation was that students would handwrite responses to the task in class time. However, as Liam had functional impairment in his writing skills (e.g., poor handwriting) and would have difficulty handwriting his task responses, he was permitted to provide *oral responses* to some parts of the assessment. Liam's teacher reported that for Stage 1 (Figure 5.11), Liam did his task "partly in writing and demonstrated answers through his work and orally; for Stage 2, he "demonstrated [the responses] during practical application in his working (in class); for Stage 3, Liam "demonstrated [his responses] graphically + orally, and determined the 'circle' as having the largest area"; and finally, for Stage 4, "an in-depth oral communication was demonstrated to the teacher". Furthermore, Liam and his teacher reported that Liam had access to *a computer* to type his responses instead of handwriting and finally submitted answers online (see Figure 5.10).

Figure 5. 9

Liam's Typed Responses to the Extended Mathematics Assessment Task (Submitted Online)

With Questions 1 and 2, these questions ask which of these listed shapes has the largest area: an equilateral triangle, a square, a regular hexagon or a circle. Question 2 is very similar to Question 1, except that it asks for a different length of string. Based on the introductory paragraph, it is safe to assume that you are meant to use a random length. This random length is assumed to be the perimeter/circumference of these shapes. I will need to know the formulas to work out the area of these shapes. These formulas will need to be converted to work in Excel. The Excel versions of these formulas are listed under a subheading. Question 3 asks whether there is a pattern between the string lengths, and where other polygons would fit in this pattern.

I have used Excel to generate 50 different string lengths randomly, in the range of 10-100. Using these string lengths, I calculated the areas of 9 different shapes: a semicircle, an equilateral triangle (3 sided shape), a square (4 sided shape), a pentagon (5 sided shape), a hexagon (6 sided shape), a heptagon (7 sided shape), an octagon (8 sided shape), a megagon (1 million sided shape), and a circle.

To answer Question 3, there is a pattern between the different shapes. This pattern is so exact that you can multiply any shape by a specific number, and get another shape. Some of these multiples are listed below (to 15 decimal places):

FROM	TO	MULTIPLE
Equilateral Triangle	Square	1.299038105676660
Square	Pentagon	1.011055363769400
Pentagon	Hexagon	1.048673810304020
Hexagon	Heptagon	1.027611589104910
Heptagon	Octagon	1.017295979017320
Octagon	Circle	1.054786175158100

There is also a miniscule difference between the megagon and circle, equal to multiplying the megagon's area by 1.00000000000329.

I have also used an online calculator to check that this data is correct. I cannot think of many ways of improving on this process, except for potentially doing more checks.

Excel Formulas

String Length: =RANDBETWEEN(10,100)

Semicircle Area: =(PI()*([String Length]/(PI()*2))^2)/2

Equilateral Triangle Area: =SQRT(3)*((([String Length]/3)^2)/4)

Square Area: =([String Length]/4)^2

Pentagon Area: =0.25*SQRT(5*(5+2*SQRT(5)))*([@[String Length]]/5)^2

Hexagon Area: =3*(SQRT(3)/2)*([String Length]/6)^2

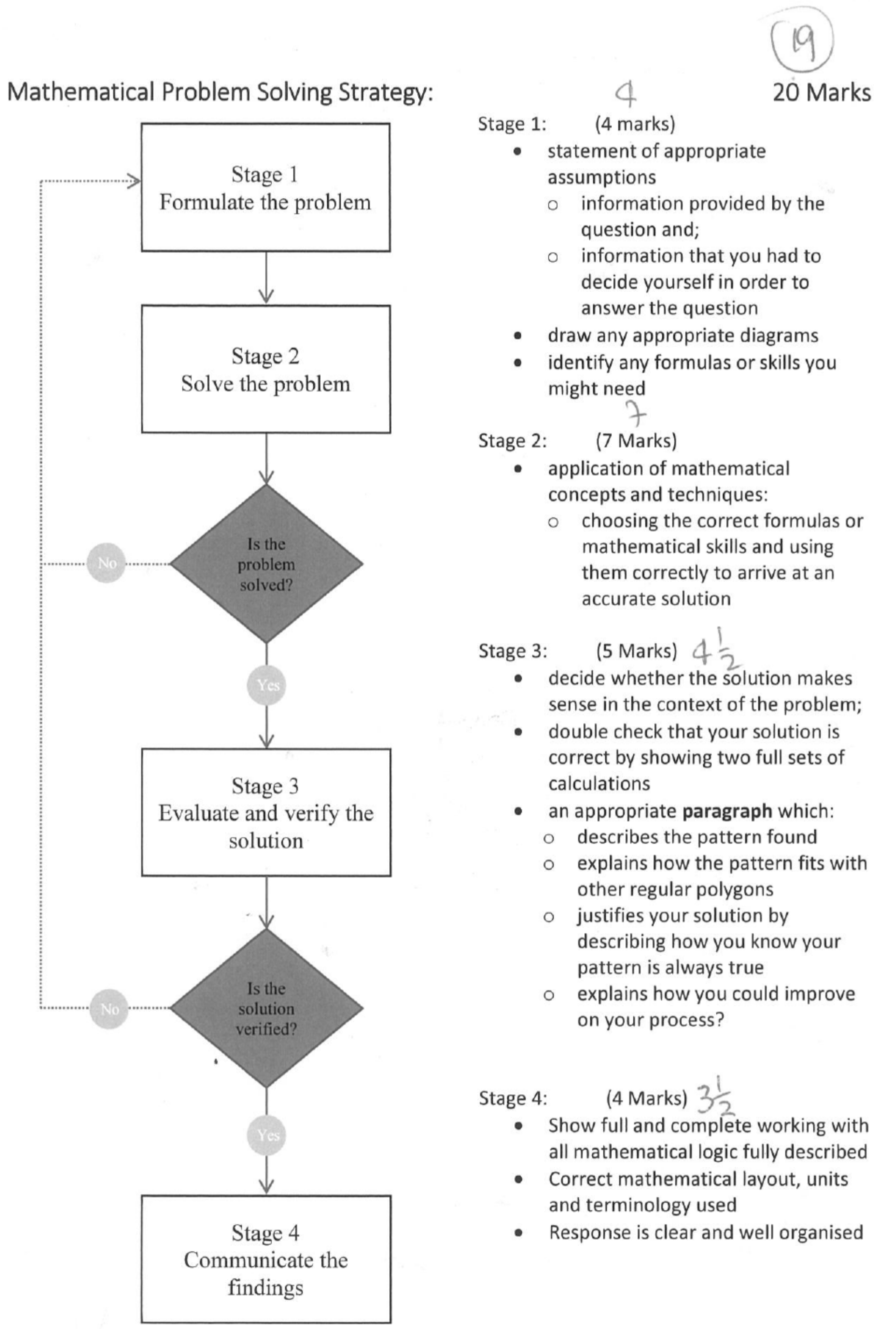
Heptagon Area: =(7/4)*(([@[String Length]]/7)^2)/TAN(PI()/7)

Octagon Area: =2*(1+SQRT(2))*([@[String Length]]/8)^2

Megagon Area: =250000*(([@[String Length]]/1000000)^2)*COT(PI()/1000000)

Figure 5. 10

Responses to Mathematics Questions in Stages 1, 3, & 4



As can be seen in Table 5.5, there was consistency in the type of adjustments reported by Liam and his teacher, which could relate to the teacher's consultation with the student about the adjustment required. By contrast, Liam's mother reported that she was unaware of how the task had been adjusted for Liam. However, she stated that if any adjustments had been made, it probably would be “double-spaced” paper due to Liam’s messy handwriting.

Table 5. 5

Adjustments Reported by the Stakeholders in Surveys

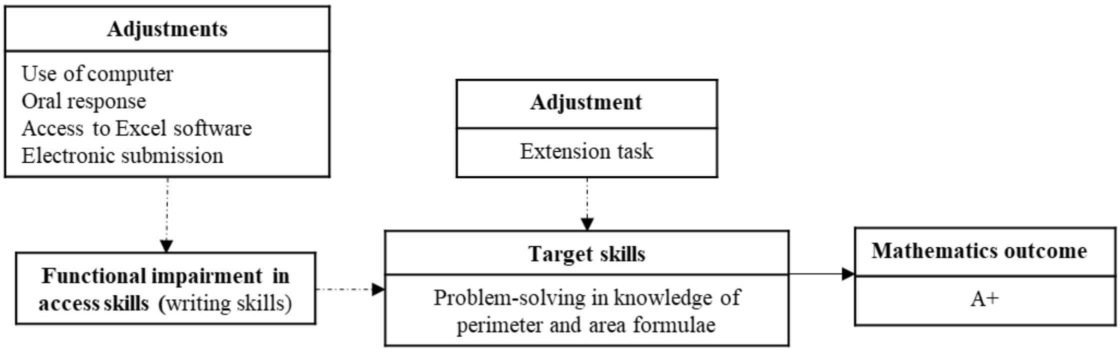
Type of adjustments	Liam	Teacher	Mother
Oral response	-	✓	-
Use of computer	✓	✓	-
Access to Excel software	✓	✓	-
Extension task	✓	✓	-
Electronic submission	✓	✓	-

Overall, in terms of target skills, the classroom adjustments (e.g., an extension task, use of computer and Excel software) were provided to Liam in order to provide him with sufficient opportunity to demonstrate his potential in Mathematics. Due to difficulty with handwriting skills, Liam was permitted to respond to some questions orally and to type the rest of the task responses instead of handwriting. Adjustments made for the Mathematics task were aligned with Liam’s educational needs.

Liam’s mathematics achievement: An A to E grading rubric was implemented to assign a grade for students’ assessment tasks, with the C standard as the expected achievement standard for his year level (Queensland Curriculum & Assessment Authority, 2020). Liam achieved A+ in the Mathematics assessment task, which implies a *very* high level of knowledge and understanding of mathematical concepts and procedures (QCAA, 2020). He was given 19/20 marks; how marks were translated to grades was not indicated. In survey responses, Liam also indicated that he was ‘very self-confident’ in Mathematics learning and achievement and stated, “since I began Middle School, I have achieved A+ grades in every term except for one, where I got an A instead. In Junior School, I have achieved A grades in almost every term”. Overall, Liam’s academic background shows that he was a high achieving student in Year 9. The relationship between Mathematics Achievement and the provided adjustments to the access and target skills of his Mathematics assessment is illustrated in Figure 5.12.

Figure 5. 11

Access and Target Skills and Adjustments for Mathematics Assessment Task



Stakeholders’ reflections on the provision of adjustments: Liam reflected that he wanted adjustments for the Mathematics task, and that the teacher discussed how the assessment could be appropriately adjusted with him. For example, Liam said that the teacher “asked whether he wanted to take the adjusted test such as more writing space, or whether he wanted to do the extension tasks”. He stated the adjustments provided to him were related to increasing the “work difficulty”. Liam remarked that the adjusted task enabled him to better demonstrate his abilities and skills in Mathematics. Liam noted that poor handwriting did not affect his abilities to undertake the task because he could type the written task. In the first Parent Survey, Liam’s mother had mentioned that Liam did not require any adjustments to perform his task as he has been a high achiever in Mathematics. However, in the second survey, she reflected that “adjustment is minimal, but that seems to be adequate/appropriate". Overall, according to the stakeholders' reflections, it seems the adjustments achieved the aim of ensuring the student had been able to demonstrate his strong capabilities in Mathematics.

Validity of adjustments to classroom assessment: The items of the Mathematics task were altered with more *complexity* for Liam to challenge him to practise mastery and achieve excellence. Although the adjustment altered the level of the target skills that were assessed, the task content was not easier or more simplified for Liam than his classmates and therefore the validity of the task was not compromised (Sireci, 2008). Furthermore, *verbally* responding to some parts of the task and *typing* the rest of the responses using a computer eliminated barriers relating to Liam's access skills impairments (e.g., poor handwriting). This means that (a) the task was made totally accessible for Liam, and (b) target skills in Mathematics were not affected by Liam's disabilities (Dembitzer & Kettler, 2018). Therefore, the provided adjustments increased the validity of the achieved grade in terms of the overall mathematical content and curriculum expectations (Sireci, 2008). However, Liam's achievement was assessed by the same rubric grading used for other students within the class while he undertook the extension task. Liam achieved A+ in Mathematics, but the criteria mentioned for grade A in this grading system did not sufficiently represent the assessment of and outcome for Liam's knowledge and abilities. According to the differential boost hypothesis (Sireci et al., 2005), the implemented adjustments for Liam, that is, the availability of computer modelling or oral responses, if available to other students, may also have improved their academic achievement (Sireci, 2008). That is, he may have achieved some benefit in his grading by the ways in which issues in access skills were addressed, rather than change to target skills. However, this effect could still be expected to be greater for Liam, given the teacher's expectations of his mathematical knowledge and skills relative to other students, and the task he completed in comparison to the set assessment task.

5.2.5. The Summary of the Case

The findings of this case study showed the experiences of an academically gifted student who was reported to have a mild autism spectrum disorder. Liam was permitted to have access to adjustments (e.g., use of a computer, oral response, Excel software, electronic submission) due to impairments in access skills (i.e., poor handwriting), required to undertake the Mathematics task. Liam was a high achiever in Mathematics who was provided with an extension task as well. The findings for this case study student indicated that having a high level of target skills and removing barriers related to writing skills had empowered the student to show his mathematical proficiency in a more cognitively-demanding task.

5.3. The Case of Daniel

5.3.1. Context of Schooling

At the time of this study, Daniel was a fifteen-year-old student in Year 9. He attended a non-government (Catholic) secondary school in a metropolitan region in Victoria with approximately equal enrolments of boys and girls. The school's ICSEA showed that the level of socio-educational advantage was average to low for this school in comparison with other Australian schools (www.myschool.edu.au). The school's website indicated that its inclusive practices valued the individual nature of students, and the school was committed to personalising learning and differentiating content, assessment and delivery in order to provide educational opportunities for all students with diverse learning needs (Retrieved from the school website).

The focus of assessment in Daniel's case study is foundation English. Daniel's teacher was female aged between 25 and 34 years old and had a teaching qualification with a bachelor's degree. She was a full-time teacher who had taught Years 7 to 12 English for over 5 years. At the time of this research study, the teacher taught Year 9 English to 26 students in Daniel's class. The teacher reported that she was informed about Daniel's disabilities through "a shared document" available to all staff at the school. She discussed Daniel's disabilities with the student, his parents, and teacher aides. The teacher's understanding of the student's disabilities and its effects on classroom learning and assessment are discussed in detail below.

5.3.2. The Nature of Daniel's Disabilities and Reported Impact[11]

The written reports of the stakeholders showed Daniel's disabilities were related to functional impairments in *cognitive* abilities. Daniel, his mother and teacher reported that Daniel had *learning difficulties*. Daniel's teacher noted that it was hard for Daniel to read novels, interpret key ideas and make connections between concepts. Daniel's mother pointed out that Daniel was not able to elaborate written answers when undertaking examinations, therefore, his responses were "very short and without details". Daniel's mother also stated that Daniel's achievements in reading, writing, and mathematics were "considerably" lower than those of his classmates in the same year level. Daniel believed even when he undertook a different assessment compared to his peers, he still "struggle[d] to get good results". Daniel's teacher stated, "[Daniel] was academically 4 years behind the rest of his peers.", so, he completed assessments that were different from those completed by his peers.

Daniel's mother further reported that Daniel was diagnosed with "*Attention Deficit Hyperactivity Disorder*" (ADHD). ADHD is a neurodevelopmental disorder that includes a combination of persistent problems such as trouble sustaining attention, hyperactivity and impulsive behaviours ([DSM-5], APA, 2013). Daniel, in the description of his ADHD, stated that he was a "more physical person". Daniel's mother noted that Daniel "struggled to have full successful days at school without disruption" before receiving medication. She cited examples of Daniel's behaviour, that "he would act out physically and the day would spiral downwards". Daniel's mother added that medication known as "Lovan" has helped Daniel noticeably manage his behaviours and improve his school attendance.

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[11] . It is important to note that Daniel stated that his mother helped him complete the survey questions. However, his responses differed from his mother's, indicating the responses reflected his own perspectives.

Further, Daniel, his mother and teacher reported that Daniel had mild *Autism Spectrum Disorder* (ASD). Daniel's mother mentioned that Daniel struggled to stay on task and "gets agitated when things are changed, or a classmate disrupts him", which clearly indicated that Daniel had restrictive patterns of behaviour resulting from autism spectrum disorder. In terms of socio-emotional characteristics, Daniel's mother stated that Daniel suffers from "anxiety". Daniel also pointed out that he became easily bored in the classroom. Daniel's teacher had reported that Daniel had a "*severe language disorder*" as well as difficulty in interpreting "spoken task requirement[s]".

As can be seen in Table 5.6, Daniel's closest contacts, in turn, provided information about the different aspects of Daniel's disabilities in surveys. For example, Daniel, his mother, and the teacher discussed learning difficulties and autism spectrum disorder. Daniel's mother drew attention to the student's anxiety and ADHD, which was not reported by the teacher. Whereas Daniel's teacher pointed out the student's speech and language disorder, neither Daniel nor his mother reported this disorder in their information. In general, the information obtained from each of the participants gives a more comprehensive understanding of the nature of Daniel's disabilities.

Table 5. 6

Characteristics of Daniel's Disabilities Reported by Daniel, his Mother and Teacher in Surveys

Characteristics of Daniel's disabilities	Daniel	Mother	Teacher
Learning difficulties	✓	✓	✓
Autism Spectrum Disorder	✓	✓	✓
Attention Deficit Hyperactivity Disorder	✓	✓	-
Language disorder	-	-	✓
Anxiety	-	✓	-

Overall, considering the reported descriptions, Daniel had internalising disorders (e.g., speech language impairment, learning difficulties) and externalising disorders (e.g., attention-deficit hyperactivity disorder, autism spectrum disorder), which all are related to neurodevelopmental disorders (DSM-5, APA, 2013). Furthermore, the nature of Daniel's disabilities and their severity have considerably affected his academic capabilities (e.g., literacy skills) that are required for learning and assessment, which in turn have led to a lag academically in comparison with his peers. In the following, the provided adjustments to reduce the impacts of Daniel's disabilities on his academic achievement are discussed.

5.3.3. Stakeholders' Perspectives about Classroom Assessment Adjustments

Daniel worked below the Year 9 level in his mainstream classroom and was not expected to learn and achieve at the same standard as his peers. Thus, to increase accessibility of instruction and assessment, Daniel was provided with instructional and assessment adjustments that enabled him to participate in and undertake classroom activities. Daniel's teacher reported that she *scaffolded instructions* for Daniel, and he could work "*one on one*" in a "*quiet working environment*". Similarly, Daniel noted that a teacher aide helped him complete his tasks.

Daniel's mother discussed the effectiveness of a *modified grading rubric* that was being used to assign a grade for Daniel. Daniel's mother stated that the teacher used the modified grading rubric to assess Daniel's schoolwork because the standard grading scale, used for other students in the class, required "extended answer and further detail which was not a skill he has". She voiced the view that if the standard grading scale was used, Daniel would achieve a grade in the "lowest zones [which was] disheartening for him". However, Daniel reported the use of a "different" grading rubric did not help him get a better result in English.

Daniel and his mother also believed that adjusting assignments and assessment by answering questions verbally would be an appropriate adjustment compared with handwriting responses in examinations. Overall, it was reported that a range of adjustments (e.g., scaffolding instructions, working one to one, working in a quiet place, use of modified grading rubric) were provided to Daniel to facilitate his participation in the classroom activities and assessments. In the following section, the classroom adjustments made specifically in the English assessment task are discussed.

5.3.4. The Student's Focus English Assessment Task and Adjustments

The assessment task for Daniel and his response are shown in Figures 5.13 and 5.14. **Access and target skills:** Daniel had functional impairments in access skills (e.g., writing skills, reading comprehension, capacity to concentrate), which were required to undertake the assessment task. At the time of this study, the task that Daniel completed was to write a formal essay based on a novel, 'Deadly, Unna?'. The intended target skills included four main elements: (a) use of language features to create coherence and add detail to texts, (b) creation of texts that show understanding of how images and detail can be used to extend key ideas, (c) creation of structured texts to explain ideas for different audiences, (d) demonstration of an understanding of grammar, selection of vocabulary from a range of resources and use of accurate spelling and punctuation (Victorian Curriculum and Assessment Authority [VCAA], 2020).

Adjustments to the English assessment task: As earlier mentioned, Daniel had major difficulties with reading comprehension, attention, processing speed, and task completion, which were skills required to undertake the English assessment task. The evidence, based on the written reports of stakeholders, shows that Daniel had not only functional impairments in access skills, but also in the target skills. Thus, Daniel required a substantial level of adjustments to complete his assessment task, which is discussed in detail below.

Daniel, his mother and teacher reported that the subject topic of the assessment task, 'Deadly Unna?', was kept unchanged. According to ACARA Australian Curriculum guidelines, students who undertake a modified curriculum should be addressing the same content area as their peers (ACARA, 2020). The focus of the task was the same novel the others were studying. During class, students had responded to study guide comprehension questions about each chapter of the novel, with Daniel receiving modified simplified comprehension questions (e.g., "Why is Blacky upset about going fishing with his dad?").

The adjusted assessment task for Daniel had a similar type of question to those in the unadjusted task, focused on character. The task response was to be planned in one class lesson and written in two lessons. However, the demands of the English assessment task for Daniel were assessed quite differently from the assessment for other students.

As mentioned previously, Daniel's essay question was modified to suit his age-related level of achievement. Classroom students without disabilities were given two essay questions and were to choose to write on one of them. The choices were either 'Deadly

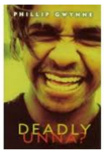
Unna? shows that standing up for your beliefs causes conflict and damages relationships' or 'By the end of Deadly Unna?, the reader no longer thinks of Gary Black as a gutless wonder'. However, Daniel did not get a choice in topic and was asked to respond to an essay question, 'in Deadly Unna?, Gary grows through a series of events to become the opposite of a gutless wonder' (see Figure 5.13). Daniel reported, "I didn't have to answer as many questions." Daniel's mother also noted that the teacher "reduced the workload" for Daniel.

Figure 5. 12

The Modified English Assessment Task for Daniel

Year 9 English Modified Text Response - Due: Week 8

<u>'Deadly Unna'</u>



Name: ______________________ **Class:** __________

Your task is to write a **formal text response essay** in response to the prompt below.

You will have **one lesson to plan** and **two lessons to write** your essay. You will be permitted **one page of double sided notes**. Your essay should be hand written or **typed in a Word Document** and **submitted in printed/electronic form**.

<u>In Deadly Unna? *Gary grows through a series of events to become the opposite of a 'gutless wonder'. Discuss.*</u>

This piece must:

- Include an introduction, 2 body paragraphs and a conclusion
- Use TEEL to build ideas in your body paragraphs
- Use quotes from the text to support your arguments

In addition to the modified content of the assessment task and task expectations, Daniel and his mother stated that a "teacher aide" helped Daniel complete the task. Likewise, Daniel noted that an "aide" helped him complete the task and "keep [him] on track". Although students were required to handwrite the summative task individually in class time, Daniel was permitted either to handwrite or to use a computer to produce his essay in a Word document. It could be submitted to the teacher either in electronic or printed form. Daniel's work sample showed that he typed the essay in a Word document and emailed it to his teacher (see Figure 5.14). Although in the adjusted task, the teacher asked Daniel to provide four paragraphs: an introduction, two "body paragraphs" and a conclusion (Figure 5.13), Daniel provided four sentences identifying separate events where the character showed 'bravery'. Although information is not provided, the response may have been scaffolded by the teacher or aide as a response to the adjusted essay prompt.

Figure 5. 13

Daniel's Response to English Assessment Task

Text response essay

. Bravery was shown when Blacky went through the without authorisation with the bullet hole still showing.

courageous behaviour or character.

. Blacky showed bravery when he broke into his dads shed. Because he wanted to clean up the graffiti for the shed this was brave for Blacky because his dad hates

. Blacky showed bravery when he stayed up all night cleaning off the graffiti. Because he did not like racism.

. Blacky showed bravery when he went to dummy reds funeral. Because he would be graded for going to the funeral

Although Daniel reported that he was not consulted about the adjustments required for this assessment task that he completed, there was a consistency between the written reports of the teacher, Daniel, and his mother about the selected adjustments to undertake the English assessment task (see Table 5.7).

Table 5. 7

Assessment Adjustments Reported by the Stakeholders in Surveys

Type of adjustments	Teacher	Daniel	Mother
Teacher aide	✓	✓	✓
Use of modified grading rubric	✓	✓	✓
Reduced workload	✓	✓	✓
Use of a computer	Student work sample showed that Daniel had typed his English task.		

Overall, the content of the English assessment task was modified for Daniel. A combination of different adjustments (e.g., teacher aide, reduced workload, use of a computer) was also used to reduce barriers resulting from Daniel's disabilities to enable him to participate in and undertake the assessment task.

The student's English achievement: In Victoria, results are reported by Level (foundation, Ls 1-2, Ls 3-4, Ls 5-6, Ls 7-8, Ls 9-10) of learning achievement (VCAA, 2020). Daniel was reported by his teacher to have achieved the standard appropriate for the middle of Level 4 in the English assessment. Daniel reported that he was 'okay' about his learning and achievement in English. As shown in Figure 5.14, Daniel's essay consisted of 92 words in four short paragraphs and without elaborations. This is consistent with the description by Daniel's mother about the effects of Daniel's disabilities on the assessment.

Furthermore, both Daniel's mother and his teacher reported that a modified grading rubric was used for Daniel to assign a grade in English task. Daniel's teacher provided a sample of the grading rubric for meeting the expected standard by the middle of Year 4 in Writing and for comparison to the standard for the end of Semester 2 for Year 8 (Daniel was in Year 9). These are shown in Figure 5.15.

Figure 5. 14

Sample Grading Rubrics for Level 4 and Year 8 Provided by Daniel's Teacher

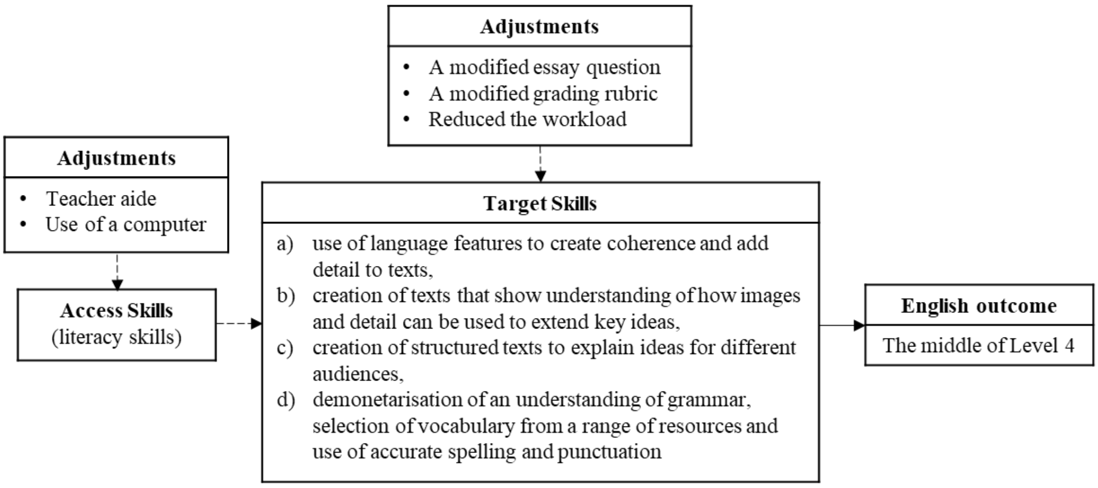
At Standard, end Semester 1, Year 4		At Standard, Semester 2, Year 8	
Writing (Creative writing, Writing Folio)		**Reading and Viewing**	
Argument	The student can generally explain how language features, images and vocabulary are used to engage the interest of audiences and can mostly describe literal and implied meaning connecting ideas in different texts.	**What have I understood? How have I come to understand it?**	The student understands how the selection of text structures is influenced by the selection of language mode and how this varies for different purposes and audiences. S/he explains how language features, images and vocabulary are used to represent different ideas and issues in texts.
Structure	The student is beginning to create texts that show understanding of how images and detail can be used to extend key ideas. S/he creates well-structured texts to explain ideas for different audiences.	**What can I do with my understanding?**	S/he interprets texts, questioning the reliability of sources of ideas and information.
Application	The student is beginning to demonstrate an understanding of grammar, select vocabulary from a range of resources and use accurate spelling and punctuation, rereading and editing their work to improve meaning.	**How can I support my arguments?**	S/he selects evidence from the text to show how events, situations and people can be represented from different viewpoints.

The expectations of these standards are very different. It is of interest that, first, the teacher focused on Writing for Daniel when the focus for other students was on Reading and Viewing. Secondly, the feedback from Daniel's teacher did not address most aspects of either standard but was focused on spelling and punctuation. Implicit in the feedback is recognition of Daniel's understanding of the character development in the novel. In her feedback to Daniel, the teacher commented: "Your response shows that you have made a good attempt at answering the prompt based on the novel 'Deadly Unna?'. However proof reading is required for some sentences to make sure capital letters and punctuation have been used correctly."

Not only was Daniel working well below the Australian achievement standard for his year level, the evidence is that the target skills for Daniel in this task did not fully match the Level 4 achievement that he was awarded. Major changes were also made in access skills that were not related to target skills, as discussed below. The relationship between English Achievement and the adjustments to the access and target skills of English assessment provided for Daniel has been illustrated in Figure 5.16.

Figure 5. 15

Access and Target Skills and the Adjustments for the English Assessment



Stakeholders' reflections on the provision of adjustments: The teacher reported that, using the modified task and grading rubric, Daniel reached the middle of Level 4, which indicated that Daniel was academically 4 years behind his same-age peers in English class. However, she reflected that even with the modifications that were made, her "expectations were too high for this student", and she "had to modify work to a very basic level for him to make any progress with his work" . This most likely reflects the nature of

Daniel’s response and the focus of her feedback on elements of the Level 4 standard, and on writing, rather than reading and viewing. The teacher reflected that a better adjustment in the future would be to create a different assessment task and provide “more one-on-one time with a learning support officer”.

Daniel’s mother reflected that support offered to Daniel had helped him undertake the English assessment. Likewise, Daniel also stated that he wanted the adjustments to undertake the task. However, Daniel reported that he still “struggle[ed] to get good results” despite being assessed differently from his classmates. Overall, the student, his mother and the teacher agreed that the provision of classroom assessment adjustments for Daniel is necessary. However, the teacher identified the need to modify the task through adjustments to the target skills further to suit Daniel’s educational needs. The important role of classroom assessment adjustments in Daniel’s academic achievement and wellbeing is discussed further in Chapter 7.

Validity of adjustments to classroom assessment: Daniel’s English task content was considerably altered in terms of the cognitive demand (Tomlinson & Moon, 2013) and level of target skills (Sireci, 2008) that were assessed for his peers without disabilities. In terms of his peers, the validity and integrity of the task were not maintained (Sireci, 2008). Although adjustment to target skills and curriculum level expectation may invalidate the assessment outcome in terms of Daniel’s peers, appropriate assessment and grading against the modified standard can be valid in terms of that level. However, there is concern that, in terms of overall focus and the achievement standard noted by his teacher, the validity of the adjusted assessment relative to the defined content and task expectations for the identified level may have also been affected. As Tomlinson and Moon (2013) noted, an assessment should ‘reflect the relative importance of each learning goal’ (p. 93).

For the essay on Deadly Unna?, the focus on the writer's use of text to create imagery and character development was the primary focus for the Year 8 standard. For Daniel, the teacher made little comment on this and focused on accuracy of basic literacy skills in writing, a very different target. If the assessment design and structure of the question had been altered to match the nature of the response provided, given Daniel did show some understanding of character in the novel, validity and integrity could be enhanced.

5.3.5. The Summary of the Case

The findings of this case study showed the experiences of a student with multiple disabilities — learning difficulties, autism spectrum disorder, attention deficit/ hyperactivity disorder and speech and language impairment — who was provided with a substantial level of classroom adjustments. The available evidence showed Daniel's disabilities had not only affected the access skills needed to undertake the English assessment task but also the target skills intended to be measured on the assessment. Daniel had adjustments to access skills through the use of a computer and teacher aide. Furthermore, the target skills of the assessment were adjusted through the reduced workload, the modified question, and modified grading rubric. Daniel reached the middle of Level 4, which indicated that he was academically behind his same-age peers in the mainstream classroom.

5.4. The Case of Leo

5.4.1. Context of Schooling

Leo was a 12 year 8-month-old student in Year 7. He attended a government high school in a metropolitan region in Queensland with approximately equal enrolments of boys and girls. The school's level of socio-educational advantage (ICSEA) was average in comparison with other Australian schools (www.myschool.edu.au). As declared on the school's website, the school recognised the disability definition as outlined in the Disability Discrimination Act 1992 (DDA). The school was committed to inclusive practices and meeting the learning needs of students with disabilities by providing adjustments to access the same opportunities enjoyed by all students. A team of school staff (e.g., a program manager, Education Adjustment Program (EAP) teachers and teacher aides) was allocated to monitor and support each student's engagement and achievement in learning. Furthermore, there were 'social-emotional support plans' for students who face issues such as poor emotional wellbeing in the school setting. Overall, these plans, coupled with pedagogy and assessment policy, are integrated to provide strategies that help meet student learning needs and improve their wellbeing (Retrieved from the school website).

Two different subject assessments, English and History, are the focus in Leo's case study. Leo's teacher was a female aged between 35 to 44 years with a bachelor's degree as her teaching qualification. She was a full-time teacher of English and humanities/social sciences in Years 7 to 10, with over 10 years of teaching experience. Leo's teacher was teaching English and history at the time of this study to a class of 27 students. Leo's teacher reported that she was informed about Leo's disabilities via emails sent out by the "Heads of Special Education Services (HOSES)" at the beginning of the school year. The teacher reported that she discussed Leo’s disabilities and their effects on classroom learning and assessment with the student, his parents, a special education teacher/learning support teacher and ‘head of department’. Furthermore, Leo’s teacher kept his parents informed about Leo’s “social issues” via emails and at parent-teacher meetings. Leo’s teacher also reported that the school received disability-related funding to support Leo’s individualised learning needs and assessment. Leo’s teacher’s survey responses indicated active engagement in understanding Leo’s disabilities and its effects through discussions with all stakeholders in Leo’s education. This engagement is discussed in more detail below.

5.4.2. The Nature of Leo’s Disabilities and Reported Impact

The information reported by Leo, his mother and teacher showed that Leo’s disabilities were mainly related to functional impairments in cognitive abilities. Leo’s mother and teacher specifically identified that Leo has a *Speech Language Impairment (SLI)*, which, in general, is identified as a delay in the mastery of language skills, affecting a child’s speaking, listening and writing (Volkers, 2018). In correspondence with researchers about the project, Leo’s parents emphasised that he was not aware that his language difficulties were categorised as a “disability”. Leo did not mention his language impairment in this research study but noted a number of areas of difficulties, discussed below.

As reported by Leo’s mother, Leo had an *auditory processing disorder*, which is a dysfunction whereby an individual’s processing of auditory information has been damaged or may have not developed in the same way as others, despite having normal hearing thresholds. A child might have difficulty hearing differences between sounds, processing spoken words and might not stay focused on listening long enough to perform a task (National Institutes of Health, National Institute on Deafness and Other Communication Disorders [NIDCD], 2019). Regarding the effects of auditory processing disorder on Leo’s learning performance, Leo’s mother said Leo “misses information” presented in the classroom. The ability to listen actively is essential to understand such information. Furthermore, as reported by Leo, he asked the teacher “a lot of questions”, which might be evidence that he was unable to comprehend fully the auditory information in the classroom when it was first presented by the teacher.

Leo, his mother and teacher reported that Leo had difficulty with *comprehension*. For example, Leo said that he could not understand “some” questions and sentences. Similarly, Leo’s teacher reported that Leo had difficulty comprehending “complicated instructions”, and she needed to provide Leo with “explicit instructions”, “checking him for understanding taught lessons”. Further, the teacher stated, “when instructions were explicit or broken down”, Leo could work independently.

Difficulties with *spelling* was another educational challenge that were described by Leo and his mother. Leo said, “I am slower at doing stuff, like spelling words”. Feeling embarrassed was one of the consequences of Leo’s spelling difficulties that was described by the student and his mother. Leo said, “when I don’t know how to spell words, I don’t want other kids to know that I don’t know how to spell the word”. Leo’s tendency to hide his spelling difficulties in class showed that his emotional well-being had been affected by his disabilities. Similarly, Leo’s mother mentioned that Leo feels “embarrassed” to ask the teacher to spell words in front of his peers. Leo’s mother added that Leo was “behind his age group in literacy, language knowledge and spelling performance”.

The evidence, based on the written comments by Leo’s teacher, indicated that Leo also exhibited procrastinating behaviour. For example, the teacher said, “[Leo] tends to hesitate to start his work without any clarification, erasing the work that he had already started without persevering”. Leo’s reported tendency to hesitation may be related to factors such as his limited attention span and difficulty staying on task. For example, Leo’s teacher reported that it was important to ensure that Leo “is not easily distracted” in the classroom by use of strategies such as “seating plans” and reminding him to “persevere with his work [rather] than giving up”. Leo and his mother did not mention procrastination behaviours occurring in the classroom.

Overall, Leo’s mother provided comprehensive descriptions of Leo’s disabilities and used official terminology such as speech language impairment, which is one of the disability categories enabling additional funding to a school under the Education Adjustment Program (EAP) within Education Queensland. Leo’s survey responses were limited to description of some learning difficulties he had experienced in the classroom. Leo’s teacher was aware of the manifestation of Leo’s disabilities in the classroom, but she may or may not know why it was occurring. For a special education teacher, such understanding may indicate a need for different pedagogical approaches. However, overall, there was consensus between the written reports of Leo, his mother and teacher regarding Leo’s comprehension and spelling difficulties although neither Leo nor his teacher mentioned auditory processing disorder in the surveys (see Table 5.8).

Table 5. 8

Characteristics of Leo's Disabilities Reported by Stakeholders in Surveys

Characteristics of Leo's disabilities	Leo	Mother	Teacher
Speech language impairment	-	✓	✓
Auditory processing disorder	-	✓	-
Comprehension difficulties	✓	✓	✓
Spelling difficulties	✓	✓	✓
Low processing speed	✓	✓	-
Distraction	-	-	✓
Academic Procrastination	-	-	✓

5.4.3. Stakeholders' Perspectives about Classroom Assessment Adjustments

Time was a common issue regarding the provision of adjustments that was discussed by Leo, his mother and teacher. Leo's mother stated that the "only solution they arrived at not to waste time in class was that he writes his classroom notes as it sounds, and then she could correct it at home". Furthermore, Leo's mother noted that the "teacher or aide scribes in the classroom [for Leo] which reduces time wasted on writing", providing evidence of additional support for Leo in the class, although no further information was provided regarding when or how consistently such scribing occurred. Leo's mother also reported that the teacher emailed her "the entire class programs on a weekly basis, including what is covered in class, what is due for homework, and what assessments and assignments are coming up with due dates". In general, involvement of the parent was an active adjustment strategy used by the teacher. The teacher identified in her survey responses the following list of adjustments provided to Leo in the classroom:

- All learning resources were available online on the Learning Place (e.g., the assessment booklet) for the student to access at home[12]
- Clarification of task throughout the paragraphs
- Extra time if required was available for [Leo] for assessments under examination conditions
- Checking for understanding with source annotations and exam questions
- Use of sentence starters for the paragraphs
- Seating plans

The adjustments reported by the teacher aligned with Leo's learning needs to overcome barriers that were related mostly to his difficulties with *auditory* and *reading* comprehension in the classroom. In the following section, the adjustments provided to Leo in the English and history assessment tasks are discussed.

5.4.4. The Student's Classroom Assessment Task and Adjustments

At the time of this study, Leo's teacher taught Leo English and history and provided assessment artefacts for Leo in both these subjects. Leo and his mother did not provide any reflections on the history assessment task completed in class and the effectiveness of the adjustments that were made. However, the adjustments made in history provide us with insight into how classroom adjustments have reduced the effects of the student's disabilities and enabled him to show what he knows and can do. First, Leo's English assessment task and the adjustments provided in this subject area are discussed.

A. English assessment task: All students were asked to draft an alternative perspective of a character within an existing fairy tale in the form of a graphic novel. As shown in Figure

[12] . Other students without disabilities also had access to the online learning sources at home.

5.17, the instructions for the assessment task were simple and Leo said that the assessment task “was about making the bad guy the good guy in the story”. Students used a “Planning Booklet” to prepare the task (see Appendix F). However, information on the planning booklet completion by Leo was not provided although Leo noted on his draft “this is not the planning to find the real one is in my book”, implying he was able to complete it. The planning booklet work did not contribute directly to the overall assessment task grade. The teacher provided feedback on individual students’ drafts (Figure 5.18). Finally, the students were asked to submit their revised product (Figure 5.19). To gain insight into Leo’s English task, first, access and target skills of English assessment are discussed, followed by the provided adjustments in this subject.

Figure 5. 16

The First Page of the English Assessment Task Sheet

Unit 2 – Transforming and Recasting Stories - Semester 1, 2018

Name: ____________________________ **Teacher:** ______________ **Form Class:** ________

Due Date: _____________________

TASK

Create an alternative perspective of a character within an existing fairy tale.
Present this perspective in the form of an extract of a **comic strip**.

Part A: Plan your story with the altered perspective
Part B: Create your storyboard developing the narrative, character identity and context
Part C: Publish your story as a comic strip using the correct conventions

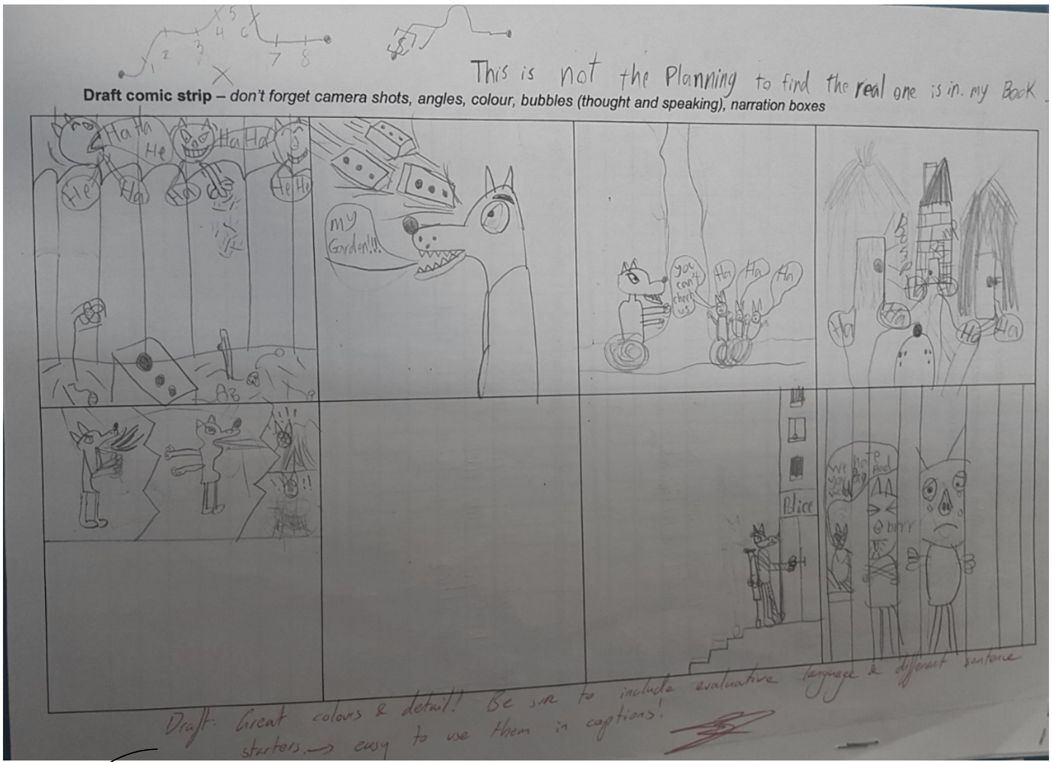
CONDITIONS	
Mode	Written
Genre	Narrative
Audience	Students
Length	Minimum of 8 frames
Resources	Open access to resources
Submission	Undertaken individually Prior notice of the assessment Drafting in lesson time with access to teacher feedback and conferencing Completed planning booklet and story board Published comic strip or graphic novel

Adjustments:

- ☐ Extra Time
- ☐ Teacher Aide Assistance
- ☐ Scribe
- ☐ Modified Word Limit
- ☐ Extension on due date
- ☐ Modified Environmental Conditions
- ☐ Alternate Activity Given
- ☐ Other -

Figure 5. 17

Leo's Draft Comic Strip and the Teacher Feedback



The teacher's feedback:

Draft: great colours & details! Be sure to include evaluative language & different sentence starters. easy to use them in captions!

Figure 5. 18

Leo's Final English Comic Strip Task

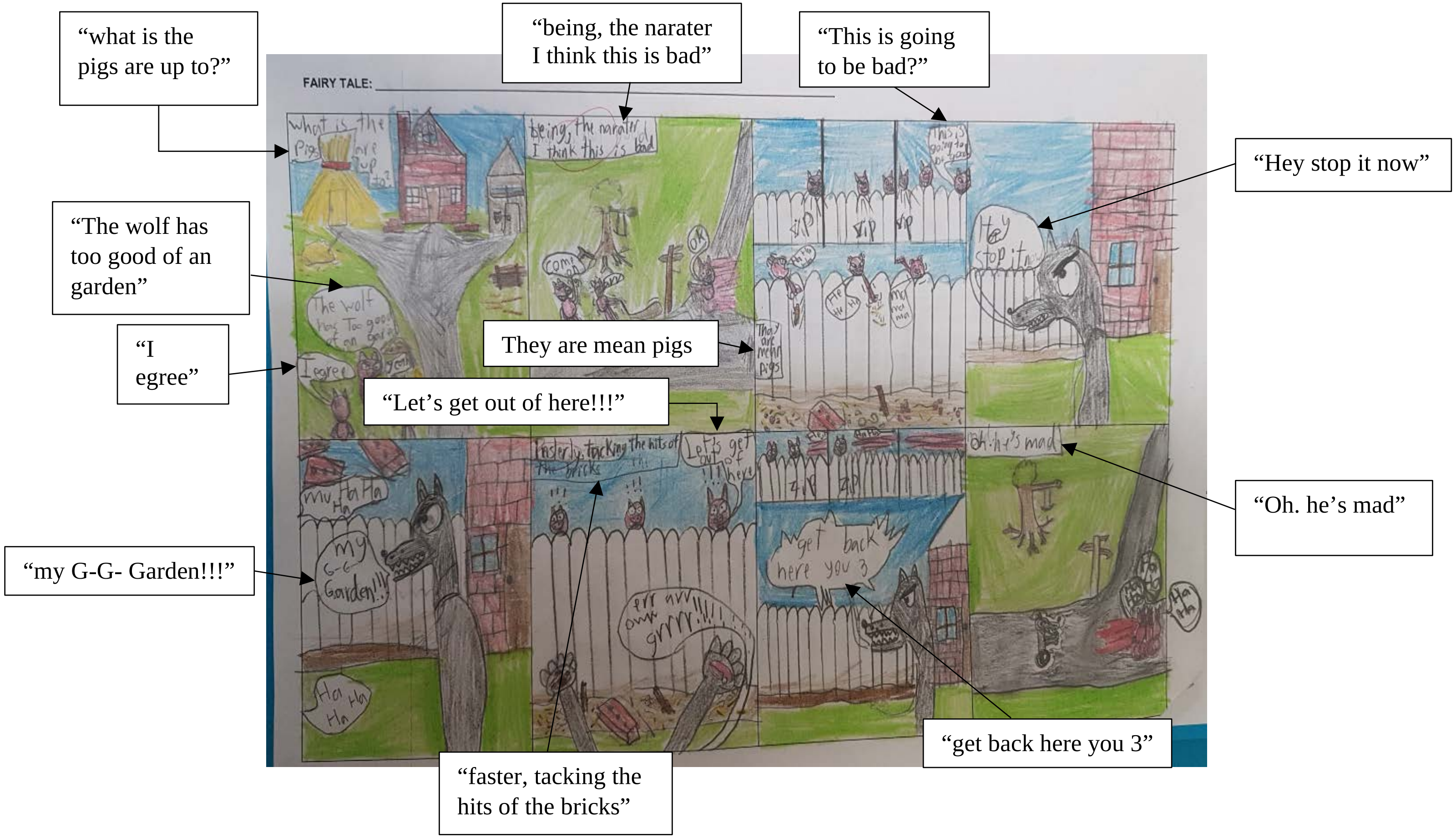
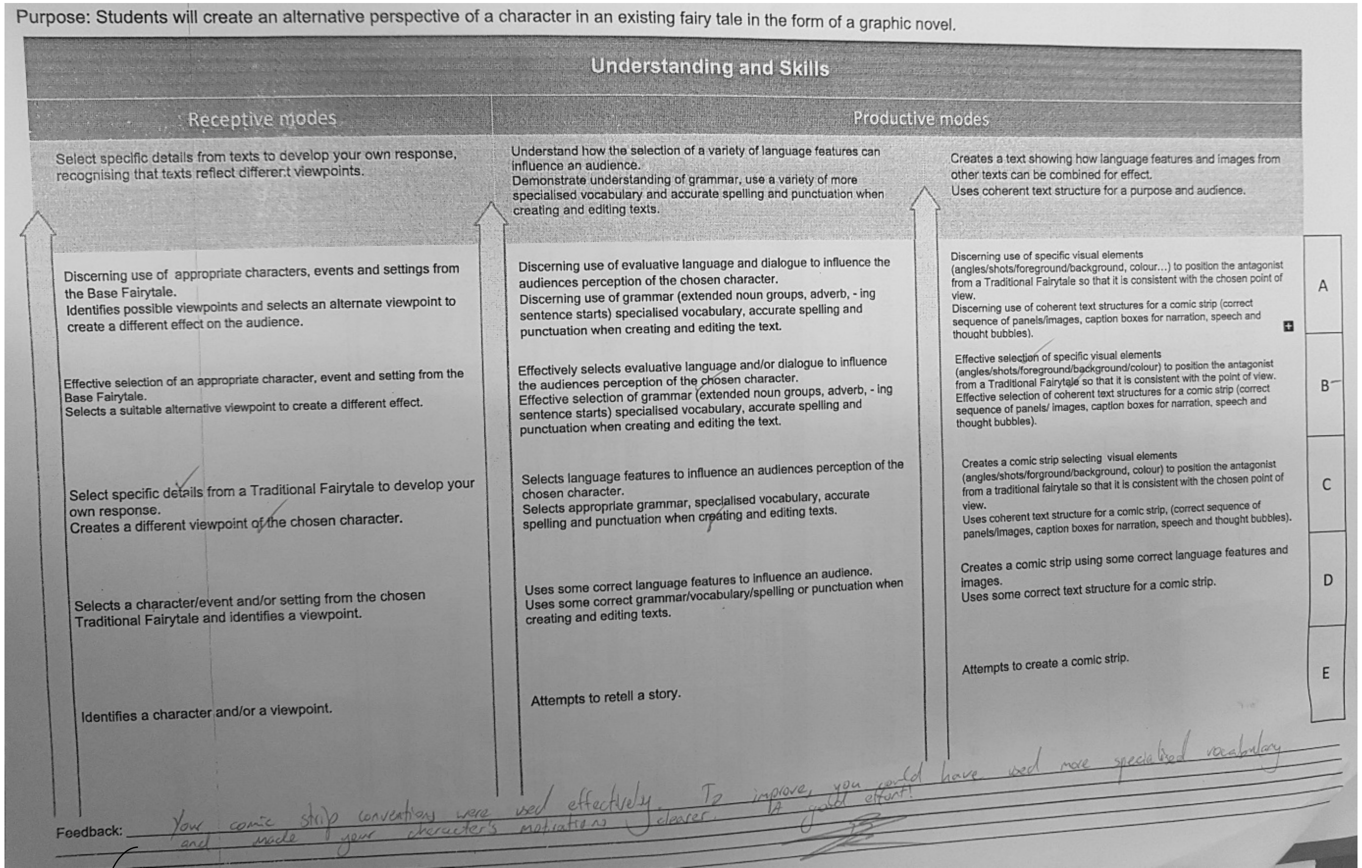


Figure 5. 19

Year 7 English Assessment Task Grading Rubric and Target Skills, Leo's grading



Purpose: Students will create an alternative perspective of a character in an existing fairy tale in the form of a graphic novel.

Understanding and Skills			
Receptive modes	Productive modes		
Select specific details from texts to develop your own response, recognising that texts reflect different viewpoints.	Understand how the selection of a variety of language features can influence an audience. Demonstrate understanding of grammar, use a variety of more specialised vocabulary and accurate spelling and punctuation when creating and editing texts.	Creates a text showing how language features and images from other texts can be combined for effect. Uses coherent text structure for a purpose and audience.	
Discerning use of appropriate characters, events and settings from the Base Fairytale. Identifies possible viewpoints and selects an alternate viewpoint to create a different effect on the audience.	Discerning use of evaluative language and dialogue to influence the audiences perception of the chosen character. Discerning use of grammar (extended noun groups, adverb, - ing sentence starts) specialised vocabulary, accurate spelling and punctuation when creating and editing the text.	Discerning use of specific visual elements (angles/shots/foreground/background, colour…) to position the antagonist from a Traditional Fairytale so that it is consistent with the chosen point of view. Discerning use of coherent text structures for a comic strip (correct sequence of panels/images, caption boxes for narration, speech and thought bubbles).	A
Effective selection of an appropriate character, event and setting from the Base Fairytale. Selects a suitable alternative viewpoint to create a different effect.	Effectively selects evaluative language and/or dialogue to influence the audiences perception of the chosen character. Effective selection of grammar (extended noun groups, adverb, - ing sentence starts) specialised vocabulary, accurate spelling and punctuation when creating and editing the text.	Effective selection of specific visual elements (angles/shots/foreground/background/colour) to position the antagonist from a Traditional Fairytale so that it is consistent with the point of view. Effective selection of coherent text structures for a comic strip (correct sequence of panels/ images, caption boxes for narration, speech and thought bubbles).	B-
Select specific details from a Traditional Fairytale to develop your own response. Creates a different viewpoint of the chosen character.	Selects language features to influence an audiences perception of the chosen character. Selects appropriate grammar, specialised vocabulary, accurate spelling and punctuation when creating and editing texts.	Creates a comic strip selecting visual elements (angles/shots/forground/background, colour) to position the antagonist from a traditional fairytale so that it is consistent with the chosen point of view. Uses coherent text structure for a comic strip, (correct sequence of panels/images, caption boxes for narration, speech and thought bubbles).	C
Selects a character/event and/or setting from the chosen Traditional Fairytale and identifies a viewpoint.	Uses some correct language features to influence an audience. Uses some correct grammar/vocabulary/spelling or punctuation when creating and editing texts.	Creates a comic strip using some correct language features and images. Uses some correct text structure for a comic strip.	D
Identifies a character and/or a viewpoint.	Attempts to retell a story.	Attempts to create a comic strip.	E

Feedback: Your comic strip conventions were used effectively. To improve, you could have used more specialised vocabulary and made your character's motivation clearer. A good effort!

The teacher's feedback:
your comic strip conventions were used effectively. To improve, you could have used more specialised vocabularies and made your character's motivation clearer.

Adjustments to the English assessment task: According to the reports of Leo, his mother and teacher, Leo was not assessed differently from the rest of the students in his class and the task itself was not adjusted. However, available evidence shows that Leo received support, although limited, to undertake his English task. Leo mentioned that near the end of the assessment, the teacher assisted him "to correct the sentences grammatically" (e.g., adding adverbs ending with -ing and noun starting) as well as "some punctuation". Leo's mother also noted that if Leo had difficulty understanding assessment requirements, the teacher gave "additional explanation and direction". For example, instructions either were "repeated or simplified".

Extra time was provided in the classroom if necessary. The teacher explained why she had not adjusted this assessment task in terms of perceived 'difficulty' of the task. She noted, "since the English unit on fairy tales was not a particularly difficult one to complete, little of the classroom materials and assessment had to be adjusted for learning". Further, Leo's teacher noted that "extra time" was available for Leo but was not required. Overall, as noted previously, Leo had difficulties with language features that were intended to be measured through the task, and the teacher had corrected some of Leo's sentences only.

Leo's English achievement: To grade students, the teacher implemented an A to E grading rubric that reflected the quality of student work based on achievement standards. In Queensland, the ACARA expected achievement standard is C — a sound level of knowledge and understanding of the content, and application of skills (Queensland Curriculum & Assessment Authority [QCAA], 2020). Leo achieved B- in the English assessment task. The evidence is that Leo was able to comprehend the requirements of the assessment task and also incorporated the teacher feedback on his draft into his final version, for example, "The wolf has too good of an garden”, “I egree”. As can be seen in Leo’s texts in speech bubbles, there were mistakes, reflecting his difficulties with spelling.

Leo was able to implement visual elements effectively, creating coherent text structures in his comic story, that is, the correct sequence of images, and caption boxes for narration (see Figure 5.19). However, the teacher’s feedback on Leo’s draft story as well as on his final work showed that Leo was likely to have difficulty in using language features appropriately, for example, specialised vocabularies and evaluative language. For instance, in feedback on the initial draft, the teacher said, “great colours & details! Be sure to include evaluative language & different sentence starters. easy to use them in captions!” (Figure 5.18). In feedback on the final comic strip task, further, the teacher stated, “your comic strip conventions were used effectively. To improve, you could have used more specialised vocabularies and made your character’s motivation clearer” (Figure 5.20).

To transform and recast the story, the capability to develop ideas is required. It seems expression of the viewpoints of the characters was somewhat challenging for Leo, although his achievement in this component was at the standard level (C). Leo’s mother had also noted that Leo found “written tasks (creative) challenging”.

Overall, areas where Leo’s responses in the English assessment task were weaker (e.g., vocabulary, spelling) correspond to descriptions and feedback provided by Leo’s teacher, Leo and his mother. The teacher’s grading has focused on conceptual skills such as the evaluative language and dialogue and visual elements with less emphasis on the language features such as grammar and spelling.

Stakeholders’ reflections on the provision of adjustments: Leo reported that the teacher had not consulted with him in relation to adjustments required for the assessment task that he completed. Leo also indicated that he wanted adjustments such as *extra time* and said, "I'm a bit slower at working and understanding some assignments. And I have problems with my spelling, and I don't like asking in front of people (like Siri or a teacher) because I feel embarrassed". However, Leo's teacher reported extra time was available for the English assessment but was not required. Leo's mother reported that she was informed about the nature of the assessment task but stated she did not know whether provision of adjustments could help Leo complete the task. The teacher considered that she would not adjust the assessment differently in future as the task was not difficult for Leo. The role of extra time in completing the English assessment task is discussed further in Chapter 7.

Validity of adjustments to classroom assessment: The English task content was not altered for Leo, and he completed his work under a standard time condition. The level of the target skills in the task itself was therefore maintained (Sireci, 2008). The adjustments provided related to access skills such as staying on task, support within the classroom and reported assistance with spelling and grammar. The former support enabled Leo to complete the task within the same timeframe as his peers and to demonstrate his capability in terms of the conceptual target skills (Sireci, 2008). However, the assistance with spelling and grammatical errors during the assessment may, to some extent, have compromised the integrity of the assessment in terms of the target skills related to literacy. The teacher's support in these areas may have affected the standard awarded on the rubric for "specialised vocabulary" which the teacher noted could have been improved, and "accurate spelling and punctuation when creating and editing texts" (the awarded standard) compared with "uses some correct grammar/vocabulary/spelling or punctuation", the lower standard. The overall award of a B- for the work may be the teacher's focus on the text and story-telling aspects of the task but may be an inflated grade when compared with those of other students and may not accurately reflect Leo's knowledge and abilities (Tomlinson & Moon, 2013). The extent to which similar support was provided to other students, and the comparability of Leo's grade to other students in this area (Sireci, 2008) is not known. However, in terms of the overall task expectations, Leo did complete the task at a successful level with the degree of support provided.

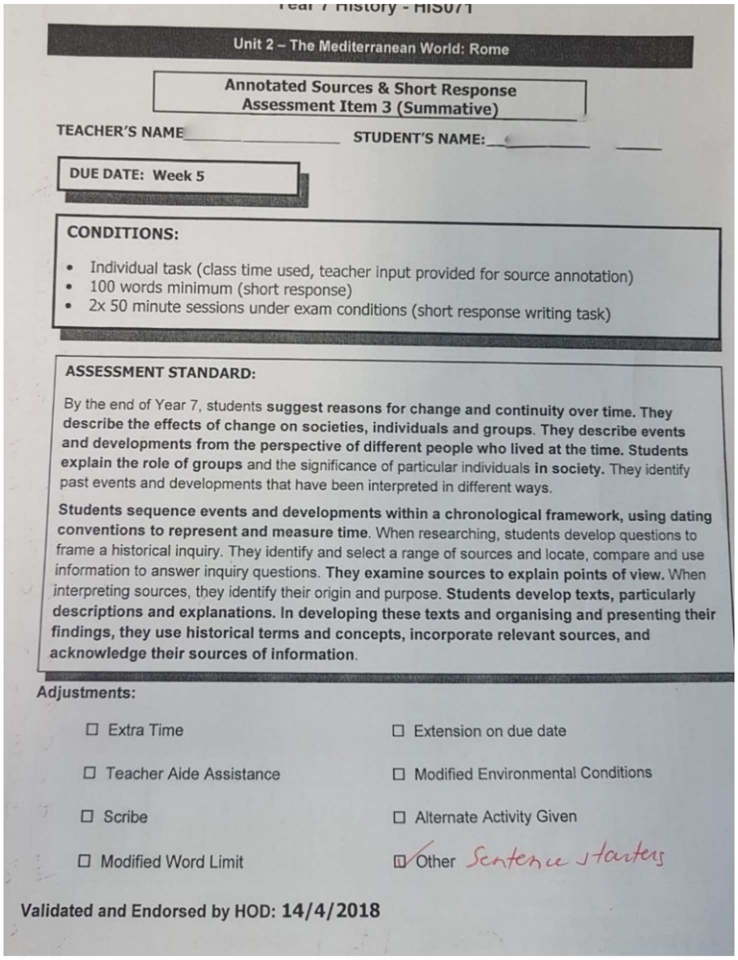
As mentioned previously, Leo's teacher also provided assessment artefacts for Leo's History assessment task. However, Leo and his mother did not provide any reflection on the History assessment task completed in the classroom. As such, discussion of Leo's history assessment task provided by the teacher follows.

B. Leo's History assessment task

The History assessment task completed by Leo, at the time of this study, was to respond to two main questions about 'The Mediterranean World: Rome': 'How and why did the role of gladiators change in Roman society?'; and, 'How did the perspective of spectators at gladiatorial combats change over time in ancient Roman society?'. Students were provided with four resource materials to inform their responses. They were required to write their responses in the form of a short answers (100 words minimum) and individually complete their task in two in-class lessons (Figure 5.21).

Figure 5. 20

Leo's History Task Sheet



Year 7 History - HIS071

Unit 2 – The Mediterranean World: Rome

Annotated Sources & Short Response
Assessment Item 3 (Summative)

TEACHER'S NAME________________ **STUDENT'S NAME:**____________

DUE DATE: Week 5

CONDITIONS:

- Individual task (class time used, teacher input provided for source annotation)
- 100 words minimum (short response)
- 2x 50 minute sessions under exam conditions (short response writing task)

ASSESSMENT STANDARD:

By the end of Year 7, students **suggest reasons for change and continuity over time. They describe the effects of change on societies, individuals and groups. They describe events and developments from the perspective of different people who lived at the time. Students explain the role of groups** and the significance of particular individuals **in society.** They identify past events and developments that have been interpreted in different ways.

Students sequence events and developments within a chronological framework, using dating conventions to represent and measure time. When researching, students develop questions to frame a historical inquiry. They identify and select a range of sources and locate, compare and use information to answer inquiry questions. **They examine sources to explain points of view.** When interpreting sources, they identify their origin and purpose. **Students develop texts, particularly descriptions and explanations. In developing these texts and organising and presenting their findings, they use historical terms and concepts, incorporate relevant sources, and acknowledge their sources of information.**

Adjustments:

☐ Extra Time	☐ Extension on due date
☐ Teacher Aide Assistance	☐ Modified Environmental Conditions
☐ Scribe	☐ Alternate Activity Given
☐ Modified Word Limit	☑ Other Sentence starters

Validated and Endorsed by HOD: 14/4/2018

Access and target skills: Writing and numeracy skills and concentration are prerequisites skills required to undertake the history task. Leo's disabilities in classroom work were noted to include comprehension and spelling difficulties, with distraction and academic procrastination also reported by his teacher (Table 5.8). Hence, in terms of access skills, Leo had functional impairments that impeded his understanding of instructions and expectations, elements of writing skills, that is, spelling and grammar, and engagement with the history task in terms of staying on task. As evident in Figure 5.22, areas where he had access skill difficulties, generic literacy capabilities of spelling or grammar, were not included as target skills in the rubric. The target skills intended to be assessed by the history summative assessment task were:

> (a) *historical knowledge and understanding*, including suggestion of reasons for change and continuity over time, explanation of the role of groups in society, description of events and developments from the perspective of different people who lived at the time.
>
> (b*) analysing and interpreting*: examination of source to explain point of view.
>
> (c) *communicating*, including sequence events and developments within a chronological framework, use of dating convention to represent and measure time, creation of texts, particularly descriptions and explanations, use of historical terms and concepts, and incorporation of relevant sources.

Figure 5. 21

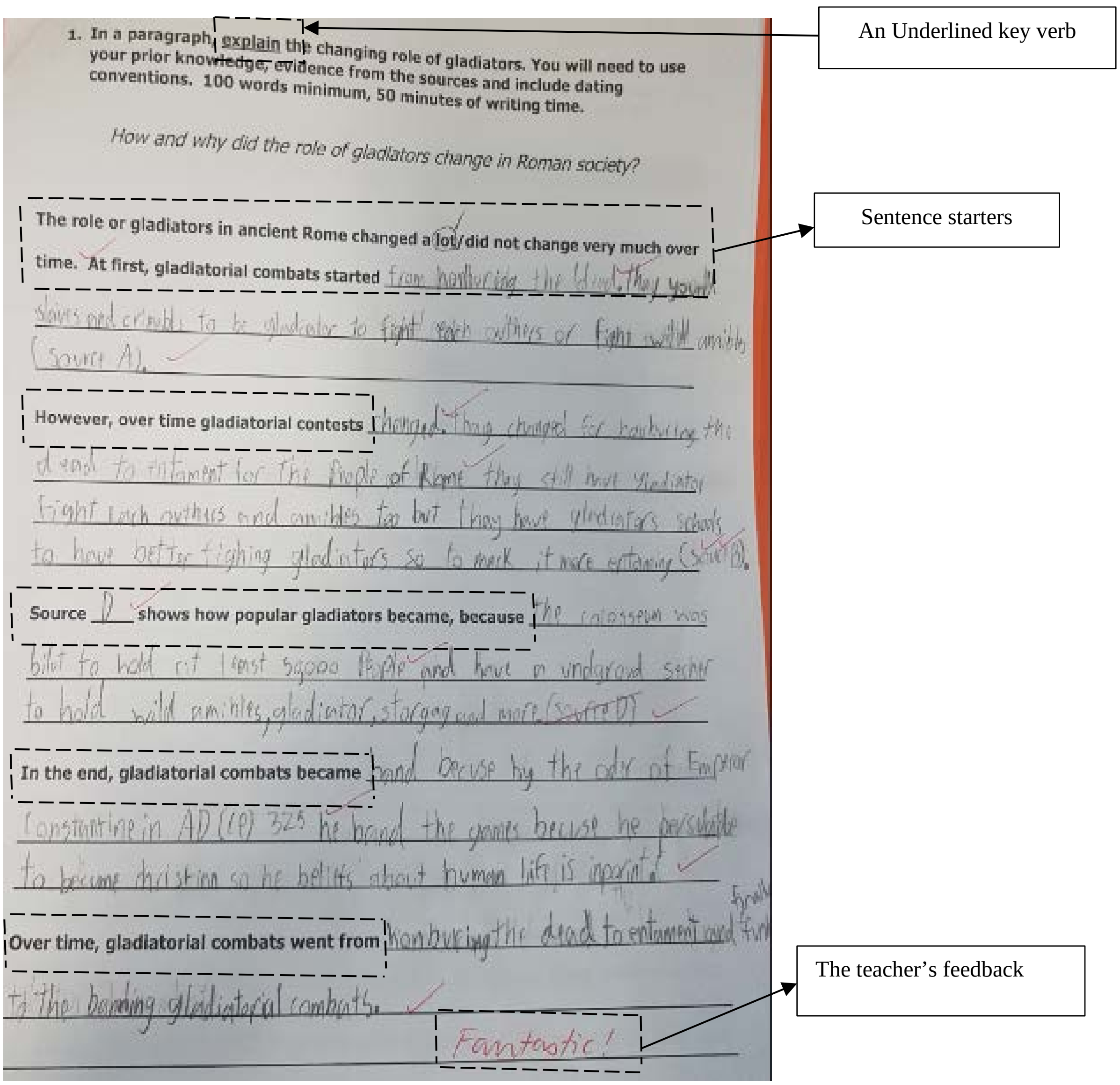
Year 7 History Assessment Task Grading Rubric and Target Skills

				A	B	C	D	E
UNDERSTANDING AND SKILLS	Historical knowledge and understanding A-	Paragraph 1	Suggest reasons for change and continuity over time	Suggestion and explanation of reasons for change and continuity in ancient Rome (gladiators) over time	Suggestion and description of reasons for change and continuity in ancient Rome (gladiators) over time	Suggestion of reasons for change and continuity in ancient Rome (gladiators) over time	Suggestion of aspects of reasons for change and continuity in ancient Rome (gladiators) over time	Statements about change and continuity in ancient Rome (gladiators) over time
			Explain the role of groups in society	Comprehensive explanation of the role of gladiators in ancient Roman society	Detailed explanation of the role of gladiators in ancient Roman society	Explanation of the role of gladiators in ancient Roman society	Description of the role of gladiators in ancient Roman society	Statements about the role of in ancient Roman society
		Paragraph 2	Describe events and developments from the perspective of different people who lived at the time	Comprehensive descriptions of the events and developments from the perspectives of different people who lived at the time (gladiators and spectators)	Detailed descriptions of the events and developments from the perspectives of different people who lived at the time (gladiators and spectators)	Descriptions of the events and developments from the perspectives of different people who lived at the time (gladiators and spectators)	Identification of events and developments from the perspectives of different people who lived at the time (gladiators and spectators)	Statements about the events and developments from people who lived at the time (gladiators and spectators)
	Analysing & interpreting A+	Annotation	Examine sources to explain points of view	Discerning interpretation of primary and secondary sources including explanation of origin and purpose	Informed interpretation of primary and secondary sources including description of origin and purpose	Interpretation of primary and secondary sources including identification of origin and purpose	Interpretation of aspects of primary and secondary sources including identification of aspects of origin and purpose	Statements about primary and secondary sources including identification of aspects of origin and purpose
	Communicating B+	Paragraphs 1 & 2	Sequence events and developments within a chronological framework	Accurate and detailed sequencing of events and developments within a chronological framework	Detailed sequencing of events and developments within a chronological framework	Sequencing of events and developments within a chronological framework	Partial sequencing of events and developments within a chronological framework	Fragmented sequencing of events and developments
			Using dating conventions to represent and measure time	Discerning use of dating conventions to represent and measure time	Informed use of dating conventions to represent and measure time	Using dating conventions to represent and measure time	Using aspects of dating conventions to represent and measure time	Statements about dating conventions
			Develop texts, particularly descriptions and explanations Develop texts and organise and present findings Use historical terms and concepts Incorporate relevant sources Acknowledge sources of information	Development of texts, including descriptions and explanations, that include: • Purposeful organisation and presentation of justified findings • Discerning use of relevant historical terms and concepts • Discerning incorporation of relevant sources • Accurate acknowledgement of their sources using appropriate conventions	Development of texts, including descriptions and explanations, that include: • Effective organisation and presentation of informed findings • Informed use of relevant historical terms and concepts • Informed incorporation of relevant sources • Acknowledgement of sources using appropriate conventions	Development of texts, including descriptions and explanations, that include: • Organisation and presentation of findings • Use of historical terms and concepts • Incorporation of relevant sources • Acknowledgment of sources of information	Development of texts, including descriptions and explanations, that include: • Partial organisation and presentation of aspects of findings • Use of historical terms • Incorporation of aspects of sources • Partial acknowledgement of sources	Development of texts, including descriptions and explanations, that include: • Fragmented presentation of aspects of findings • Use of everyday language • Use of sources • Lists of sources

Adjustments to the history assessment task: Leo's teacher reported that Leo used the same assessment task sheet as the other students with the same questions posed. However, the adjustment provided to Leo was a writing template with sentence starters for his response (Figures 5.23 & 5.25; represented in typed format in Figures 5.24 and 5.26 respectively). The sentence starters were bolded, with drawn lines for writing his response. The sentence starters provided a partial framework or scaffold that assisted Leo to initiate his sentences or idea. Moreover, sentence starters clarified information that was required to complete paragraphs. The teacher had stated that Leo was easily distracted, but he worked independently when task instructions were clear. Thus, using sentence starters was an adjustment that addressed these issues, as discussed below.

Figure 5. 22

Leo's Response to the First Question of the Adjusted History Assessment Task



1. In a paragraph, explain the changing role of gladiators. You will need to use your prior knowledge, evidence from the sources and include dating conventions. 100 words minimum, 50 minutes of writing time.

How and why did the role of gladiators change in Roman society?

The role or gladiators in ancient Rome changed a lot/did not change very much over time. At first, gladiatorial combats started from honburing the dead. they youth slaves and criminals to be gladiator to fight each outhers or fight with aminils (Source A).

However, over time gladiatorial contests changed. they changed for honburing the dead to entament for the people of Rome they still have gladiator fight each outhers and amintes too but they have gladiators schools to have better fighing gladiators so to mark it more entaning (Source B).

Source D shows how popular gladiators became, because the colossum was bilt to hold at least 50000 people and have a undgroud secter to hold wild aminles, gladiator, storgag and more (Source D)

In the end, gladiatorial combats became band becuse by the oder of Emperor Constantine in AD (CE) 325 he band the games becuse he persuaded to become christian so he beliffs about human life is inportant.

Over time, gladiatorial combats went from honburing the dead to entament and finally to the banning gladiatorial combats.

Fantastic!

Figure 5. 23

Leo's Response to the First Question of the Adjusted History Assessment Task (in typed form for clarity)

1. In a paragraph, explain the changing role of gladiators. You will need to use your prior knowledge, evidence from the sources and include dating conventions. 100 words minimum, 50 minutes of writing time.

How and why did the role of gladiators change in Roman society?

The role or gladiators in ancient Rome changed a lot / did not change very much over time. At first, gladiatorial combats started from honburing the dead. Thay youed slaves and crimabls to be gladiator to fight each outhers or fight wild amibles (source A).

However, over time gladiatorial contests changed. thay changed for houburing the dead to entament for the people of Rome they still have gladiator fight each outhers and amibles too but thay have gladiators schools to have better fighing gladiators so to mack it more entaming (source B).

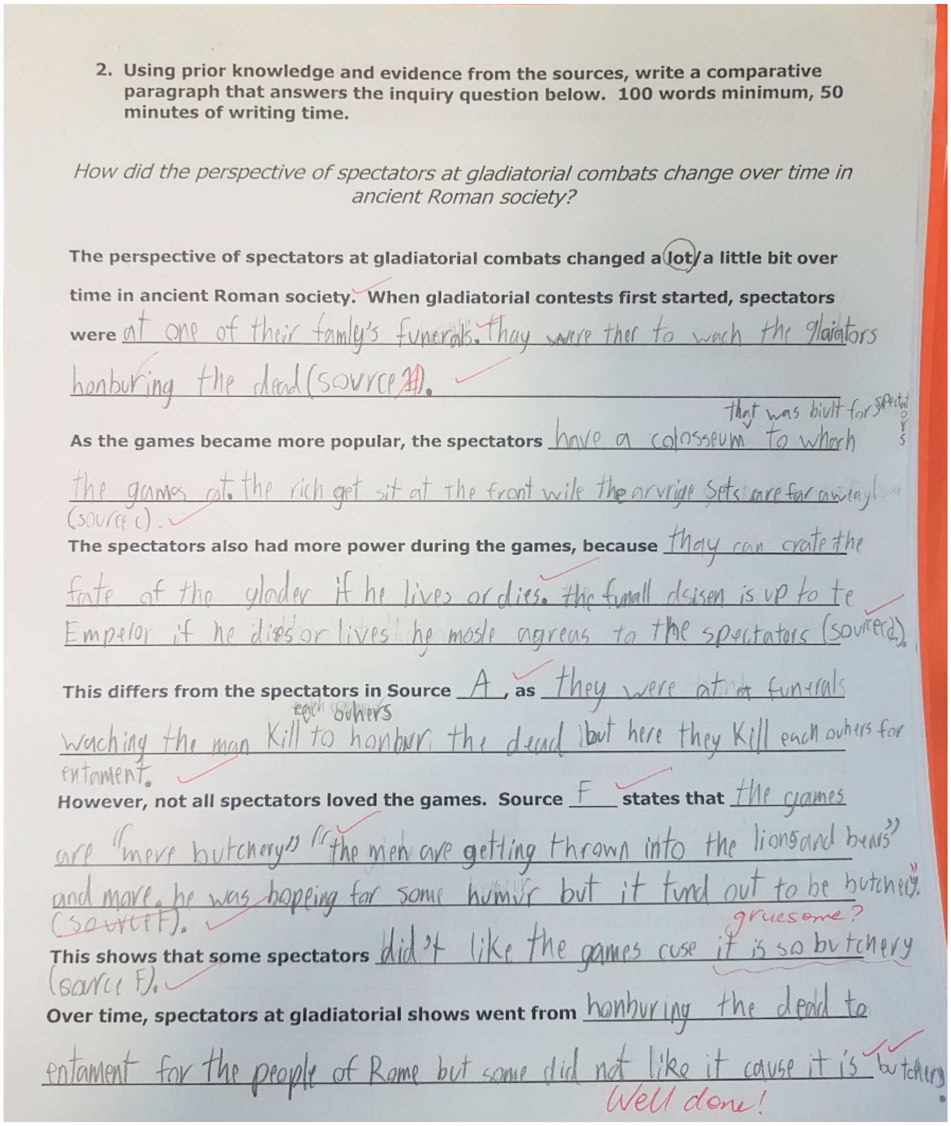
Source __D__ **shows how popular gladiators became, because** the colosseum was bilut to hold at least 50,000 people and have a undgroud secher to hold wild amibles, gladiator, storgag and more (source D)

In the end, gladiatorial combats became band becuse by the oder of Emperor Constantine in AD (ce) 325 he band the games becuse he persuade to becume Christian so he beliefs about human life is inporint.

Over time, gladiatorial combats went from honburing the dead to entament and finally to the banning gladiatorial combats.

Figure 5. 24

Leo's Response to the Second Question of the Adjusted History Assessment Task



2. Using prior knowledge and evidence from the sources, write a comparative paragraph that answers the inquiry question below. 100 words minimum, 50 minutes of writing time.

How did the perspective of spectators at gladiatorial combats change over time in ancient Roman society?

The perspective of spectators at gladiatorial combats changed a lot/a little bit over time in ancient Roman society. When gladiatorial contests first started, spectators were at one of their famly's funerals. thay were ther to wach the glaiators honburing the dead (source A).

As the games became more popular, the spectators have a colosseum that was biult for spectators to whach the games at. the rich get sit at the front wile the arvrige sets are far away (source C).

The spectators also had more power during the games, because thay can crate the fate of the glader if he lives or dies. the finall dsisen is up to te Emperor if he dies or lives he mosle agreas to the spectators (source D).

This differs from the spectators in Source A**, as** they were at funerals waching the man kill each others to honburn the dead but here they kill each others for entament.

However, not all spectators loved the games. Source F **states that** the games are "mere butchery" "the men are getting thrown into the lions and bears" and more. he was hopeing for some humir but it turnd out to be butchery. (source F).

This shows that some spectators did't like the games cuse it is so butchery gruesome? (source F).

Over time, spectators at gladiatorial shows went from honburing the dead to entament for the people of Rome but some did not like it cause it is butchery.

Well done!

Figure 5. 25

Leo's Response to the Second Question of the Adjusted History Assessment Task (in typed form for clarity)

2. Using prior knowledge, dating conventions and evidence from the sources, write a comparative paragraph that answers the inquiry question below. 100 words minimum, 50 minutes of writing time.

How did the perspective of spectators at gladiatorial combats change over time in ancient Roman society?

The perspective of spectators at gladiatorial combats changed a lot / a little bit over time in ancient Roman society. When gladiatorial contests first started, spectators were at one of their famly's funerals. Thay were ther to wach the glaiators honburing the dead (source 1).

As the games became more popular, the spectators have a colosseum that was biult for spectators to wach the games at. the rich get sit at the front wile the arvrige sets are far aweay (source c).

The spectators also had more power during the games, because thay can crate the fate of the glader if he lives or dies. the funall dsisen is up to the Emperor if he dies or lives he mosle agreas to the spectators (source d).

This differs from the spectators in Source _A_**, as** they were at a funeral waching the man kill each outhers to honbur the dead but here they kill each outhers for entament

However, not all spectators loved the games. Source _F_ **states that** the games are "mere butchery" "the men are getting thrown into the lions and bears" and more. he was hopeing for some humur but it tund out to be butchery (source F).

This shows that some spectators did't like the games cuse it is so butchery (source F)
Over time, spectators at gladiatorial shows went from honburing the dead to entament for the people of Rome but some did not like it cause it is butchery.

Leo's History achievement: As mentioned previously, in Queensland, teachers use an A to E grading rubric to assign a grade to student work, with the C standard as the expected achievement standard for the Year level (Queensland Curriculum & Assessment

Authority [QCAA], 2020). Leo's History assessment task results for the target skills are shown in Figure 5.22. According to Leo's teacher's written report, Leo attained A in the History assessment task overall, that is, Leo performed at a *high* level of knowledge and understanding of Year 7 history (QCAA, 2020).

The teacher' reflection on the provision of adjustments: Reflection on the history assessment task was provided by Leo's teacher only. As discussed by Leo's teacher, the provided assessment adjustments had positive effects on Leo's performance assessment. For example, she stated the use of sentence starters "allowed him to use his strengths, show his knowledge & provide evidence to support statements". As evidence that the adjustment provided to Leo assisted him to meet the academic expectations for his Year level, his teacher drew attention to the results that Leo achieved in history. She stated that Leo attained an A^- for "historical knowledge and understanding", an A^+ for "analysing and interpreting" and a B^+ for "communicating" on the assessment task, while he previously had only achieved a D in history. The teacher added that the adjustment allowed Leo to use his "strengths" and show his historical knowledge. In feedback on the history assessment task, the teacher said, "you showed a discerning understanding of the changing role of gladiators + the different perspectives of spectators. your ideas were clear + you incorporated dates, sources, and your own knowledge. Well done!" Overall, Leo's teacher found the selected adjustment beneficial for Leo and expressed her satisfaction of Leo's performance through the positive feedback that he was given.

Validity of adjustments to classroom assessment: In terms of the assessment task rubric, the History task target skills themselves were not altered for Leo (Sireci, 2008).

However, the provision of the adjustments to complete the task using starter sentences eliminated barriers relating to Leo’s access skills impairments (e.g., low attention span, comprehension difficulties). Through these, (a) the major target focus of the history task was made fully accessible for Leo, and (b) the assessment of the target skills was not influenced by Leo’s disabilities. The provision of the adjustments reduced the cognitive load of completing the task. The question is whether such reduction of load may have enhanced the history grade of other classroom students. Under the differential boost hypothesis (Sireci et al. 2005), the question as to whether the reduction in cognitive load in terms of organisation of thoughts and structuring of responses affected target or access skills would require further research with students without disabilities or with other disabilities completing the adjusted task form. On the evidence, however, it is probable that under the differential boost hypothesis, the improvement would be greater for Leo. This reflects the differential effect in Leo’s history grade in Term 1 (D) and Term 4 (A), which indicates that the adjustment, through increasing the task accessibility, improved the student’s achievement. Under the provided adjustment, Leo was able to demonstrate his historical knowledge and skills, and hence, the overall validity of the measure of his historical reasoning knowledge and skills was increased.

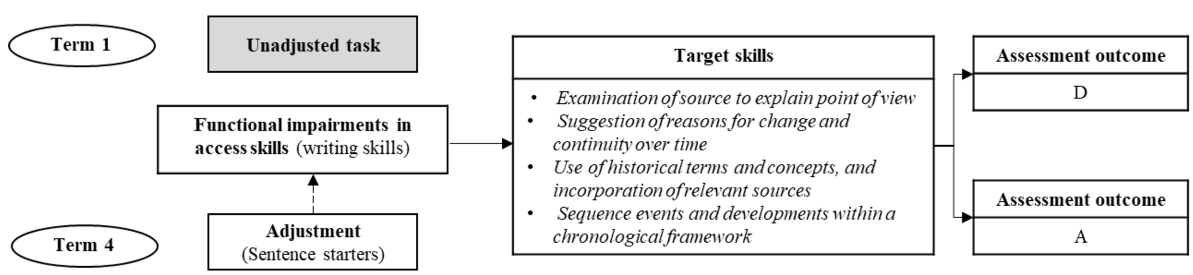
5.4.5. Summary of the Case

The findings of this case study demonstrate the experiences of a student with a speech-language impairment who had major difficulties using accurate spelling in the English and History assessment tasks and had issues in his work habits related to staying on task and perseverance. The English assessment task was not assessed differently for Leo and was completed under a standard time condition. However, Leo's spelling and grammatical errors to some extent had been corrected by the teacher. Leo achieved a B- in the English task. Leo met the expected Achievement Standard for the English task and achieved the main target skills. However, Leo's grade may not accurately reflect his English knowledge and abilities compared with other students within the classroom.

In the History assessment, the task was not adjusted in Term 1, and Leo achieved a D grade. However, a writing template with starter sentences was used in the Term 4 history assessment to increase the task accessibility, and Leo achieved an A. In Figure 5.27, his History achievement under unadjusted and adjusted assessment conditions has been illustrated. The finding for this student showed that the access skills required for the History assessment were target skills that were planned to be assessed in the English assessment task. Therefore, when Leo does not have sufficient access skills to do the History task, his grade, D, cannot reflect what he knows and can do (Kettler, 2015).

Figure 5. 26

Target Skills and the Adjustment for the History Assessment Task in Terms 1 & 4



5.5. Chapter Summary

In this chapter, further insights and understanding have been sought about how educational adjustments affected or improved academic achievement of secondary school students with disabilities, by analysing the experiences of four case study students and their parents and teachers. All four case study students were permitted to access classroom assessment adjustments. In the case of Alfie, the student had dysgraphia, an impairment in written expression, and difficulties with spelling and coherent writing. Alfie undertook the same Mathematics assessment as other students in the classroom. The student had adjustments to access skills including a trained scribe, extra time, and a separate space. The main adjustment, access to a scribe, did not affect the validity of the task in terms of target skills. The findings showed that the implemented adjustments improved his Mathematics result and the student's perception of adjustments positively.

Liam, the second case study, was a 'gifted' student who was identified as having autism spectrum disorder and speech and language delay. In response to Liam's mastery in Mathematics, he undertook an extension task and analysed the mathematical problems using Excel. He provided oral responses to some parts of the task and typed the rest of his responses due to functional impairments in access skills (e.g., handwriting). The task integrity was maintained with increased demand. The adjustments enabled Liam to demonstrate his full potential in a more complicated Mathematics task.

In the case of Daniel, the student had multiple disabilities, including learning difficulties, autism spectrum disorder, attention deficit hyperactivity disorder, and speech and language impairment. Given the considerable effects of the disabilities on the student's learning, the English assessment task's content — target skills — was significantly changed. The student used a computer to word process his responses with the support of a teacher aide due to functional impairments in access skills (e.g., writing and reading skills). A modified grading rubric was used to determine the level of the student's achievement. In comparison with the English task of other classroom students, the validity and integrity of Daniel's task were not maintained. However, validity was appropriate for the level at which he was assessed. Although the adjusted task improved the student's achievement, he was dissatisfied with his English achievement level.

In the last case study, the student, Leo, was identified as having speech and language impairment, auditory processing disorder, and learning disabilities (i.e., spelling difficulties, reading comprehension). Leo's work samples in English and history were used in this study. The English task was not assessed differently, and he undertook his work under a standard time condition. The student's spelling, grammar and punctuation errors to some extent were corrected by the English teacher, which potentially compromised the integrity of the task in terms of target skills. In the history assessment task, a writing template with starter sentences was used to increase the task accessibility. This adjustment empowered the student to undertake his task effectively. A differential effect was found between Leo's history grades in Terms 1 and 4. Findings showed that the effect of the adjustment on task integrity, in terms of target skills, was limited.

The findings in this chapter addressed the Research Question '*How does academic achievement relate to selected adjustments to classroom assessment for students with disabilities?*'. Overall, the findings show that adjustments do make a contribution to the improvement of student achievement outcomes. They also show that the nature of adjustments has to interact closely with the needs of each individual student while maintaining validity and integrity of the assessments. As students with disabilities present with diverse and often multiple needs, teachers and others in the school communities need to work through complex adjustment scenarios within the framework of the curriculum. As these case studies show, a further issue that confronts teachers, related to the achievement of students with disabilities, is not only the provision of appropriate adjustments but also how to report the achievement outcomes of students on adjusted classroom assessments against standard, or modified, classroom assessment rubrics. The following chapter presents findings exploring the final further research question regarding the provision of adjustments for students with disabilities and the relationship between the adjustments, student achievement and academic wellbeing.

CHAPTER 6: Findings of Qualitative Cross-Case Analysis — Strand 2

6.0. Overview

As described in Chapter 3, a mixed method research design with two strands was used in this study. In Strand 1, a quantitative design was used to examine relationships and discrepancies between academic achievement and academic wellbeing components for Australian students with and without disabilities. These results were reported in Chapter 4. In Strand 2 of the study, reported in Chapter 5, four qualitative case studies of students with disabilities were undertaken. Each case study was individually investigated as to how academic achievement related to classroom assessment adjustments. Alfie's and Liam's teachers provided information on adjustments in Mathematics assessment tasks, while Daniel's and Leo's teachers provided information on adjustments in English assessment tasks. A further adjustment example in History was also provided for Leo.

Chapter 6 is a continuation of Strand 2 and qualitative analyses. The purpose of the chapter is to investigate academic achievement under adjusted conditions in relation to academic wellbeing across the four case study students in two subject areas — Mathematics and English. The findings presented in the chapter address Research Question 5:

How does academic achievement under adjusted conditions relate to academic wellbeing (academic self-concept, academic responsibility, school satisfaction) of secondary students with disabilities?

In Strand 1 of the study, school English and Mathematics grades were utilised as an indicator of the academic achievement for students with and without disabilities. Similarly, only the case study students' English and Mathematics grades were used in this analysis for Strand 2 and Research Question 5. Therefore, English and Mathematics Achievement in relation to the corresponding self-concepts, academic responsibility and School Satisfaction were investigated. Three students, Leo, Alfie, Liam, were assessed using the A to E grading framework of Queensland schools, and Daniel was assessment using the Level framework of Victoria.

As in Strand 1 of the study, the four case study students with disabilities completed the Academic Wellbeing Questionnaire comprised of three scales: (i) the Self Description Questionnaire II (SDQ-II); (ii) the Intellectual Achievement Responsibility Scale (IAR); and (iii) the subscale of School Satisfaction. Three subscales of the SDQ-II were used: Mathematics Self-concept, English Self-concept, and General School Self-concept. As noted in Chapter 2, Literature Review, academic self-concept has an evaluative and differentiable nature (Marsh et al., 2015), and therefore specific domains of self-concepts should be studied with regard to corresponding academic achievement. In this strand of the study, Mathematics and English Achievement were investigated in relation to Mathematics and English Self-concepts, respectively. Academic responsibility comprised two subscales: Internal Responsibility for Success and Internal Responsibility for Failure. As in Strand 1, scale (mean) scores of the subscales in academic self-concept and School Satisfaction subscale were calculated for each individual case study student. For academic responsibility, the scale score is the total score for the scale items.

For all three scales, higher scale scores indicate more positive academic self-concept, internally oriented responsibility for success and failure, and higher School Satisfaction. The mean scores were also used to compare the academic wellbeing of case study students with the students with and without disabilities in Strand 1 of the study. Thus, Box Plots were created to illustrate distributions of scores on the variables of interest, described further below. In this chapter, the academic wellbeing of each case study is analysed first, and then the findings drawn from the relationships between academic achievement and academic wellbeing are presented.

6.1. Findings

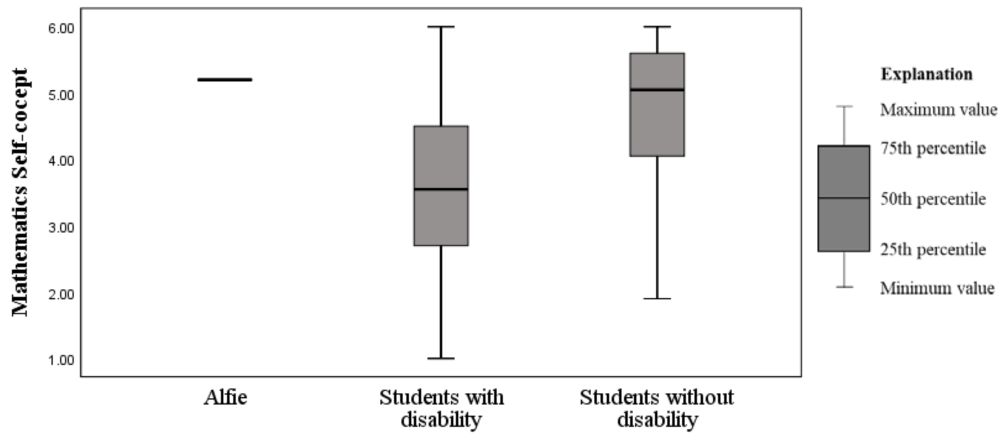
6.1.1 Academic Wellbeing

Alfie — At the time of the study, Alfie was a 14-year-old student in Year 9. As reported by Alfie, his mother and teacher, Alfie's main disability was dysgraphia, an impairment in written expression, and difficulties with spelling and coherent writing.

Alfie's English, Mathematics and General School Self-concepts: Alfie's responses to the academic subscales of the Self Description scale showed he perceived his abilities differently in Mathematics and English. Alfie had a positive perception of his mathematical skills. In the Mathematics Self-concept subscale, Alfie indicated the statements of 'Maths is one of [his] best subjects', '[he] enjoys doing Maths', '[he] gets good marks in Maths' and '[he] looks forward to Maths classes' were true. His scale score (*M* = 5.2) for Mathematics Self-concept was approximately in the 75th percentile of distribution for students with disabilities (*M* = 3.41, *SD* = 1.42) and approximately equivalent to the median score for students without disabilities (*M* = 4.72, *SD* = 1.08) in Strand 1 (Figure 6.1).

Figure 6. 1

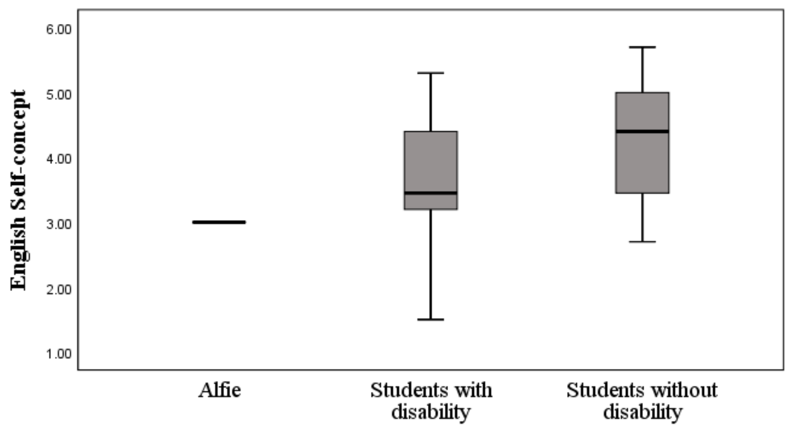
Box Plot Distributions for Scale Scores on Mathematics Self-concept for Alfie and Students with and without Disabilities



By contrast, Alfie had a negative perception about his English capabilities. In the subscale of English Self-concept, Alfie reflected his feelings through the statements that showed '[he is] hopeless in English classes', '[he] hates reading', '[he does] badly on tests that need a lot of reading ability' and '[he has] trouble expressing myself when [he tries] to write'. In direct contrast with his Mathematics Self-concept, Alfie's score (M = 3) in English Self-concept was at the 25th percentile of distributions of median scores for students with disabilities (M = 3.59, SD = .94) and students without disabilities (M = 4.26, SD = .852) in Strand 1 of this study (Figure 6.2).

Figure 6. 2

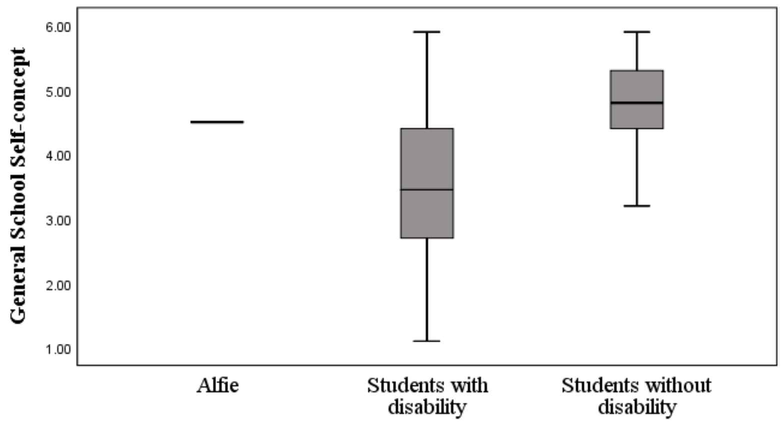
Box Plot Distributions for Scale Scores on English Self-concept for Alfie and Students with and without Disabilities



For the General School Self-concept subscale, the findings indicated that Alfie perceived his academic abilities in most school subjects positively. Alfie believed '[he learns] things quickly in most school subjects', '[he is] good at most school subjects', '[he does] well in tests in most subjects' and 'If [he works] really hard, [he] could be one of the best students in my school'. Alfie's score (*M* = 4.5) in General School Self-concept was in the 75th percentile of median distributions for students with disabilities (*M* = 3.60, *SD* =1.20) and approximately equivalent to the median score for students without disabilities (*M* = 4.75, *SD* = .71) in Strand (Figure 6.3).

Figure 6. 3

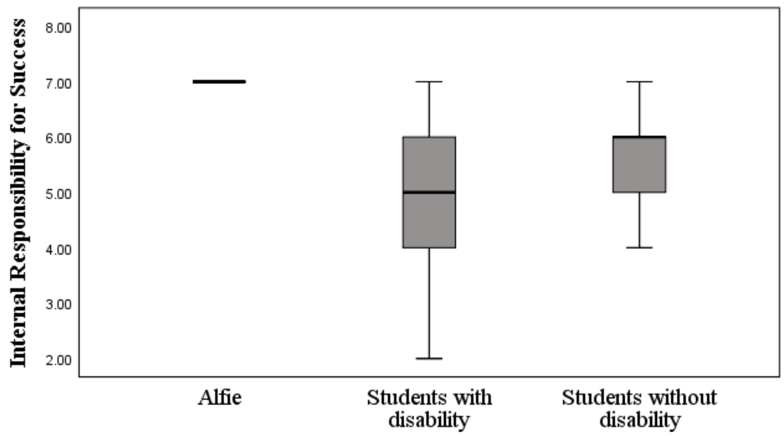
Box Plot Distributions for Scale Scores on General School Self-concept for Alfie and Students with and without Disabilities



Alfie's Academic Responsibility for Success and Failure: Alfie's responses to the IAR scale demonstrated that he tended to take Internal Responsibility for Success. For example, Alfie believed that if he 'did better than usual in a subject at school, it would probably happen because [he] tried harder'. Alfie's score for Internal Responsibility for Success (I+ = 7) was at a high level compared with the scores for both students with disabilities (*M* = 5.09, *SD* = 1.30) and without disabilities (*M* = 5.60, *SD* = 1.16) (Figure 6.4).

Figure 6. 4

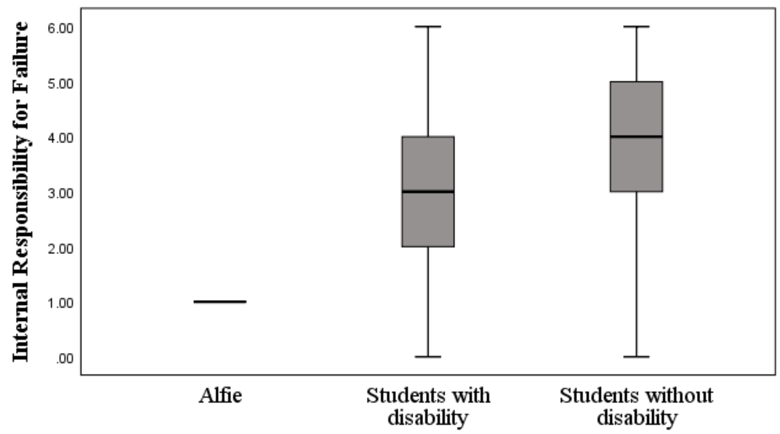
Box Plot Distributions for Scale Scores on Internal Responsibility for Success for Alfie and Students with and without Disabilities



By contrast, the findings showed that Alfie was more likely to have an externally-oriented responsibility for failure. For example, in response to statements such as if he finds 'it hard to work maths problems', has 'trouble understanding something' and/or does not 'do as well as usual in a subject at school', Alfie perceived factors such as task difficulty, unclear instructions and classroom distractions as the causes of failure at school. Alfie's scale score for Internal Responsibility for Failure (I- = 1) was lower than the 25th percentiles of distributions of scores for students with disabilities (*M* = 3.04, *SD* = 1.56) and students without disabilities (*M* = 3.63, *SD* = 1.38) in Strand 1 (Figure 6.5).

Figure 6.5

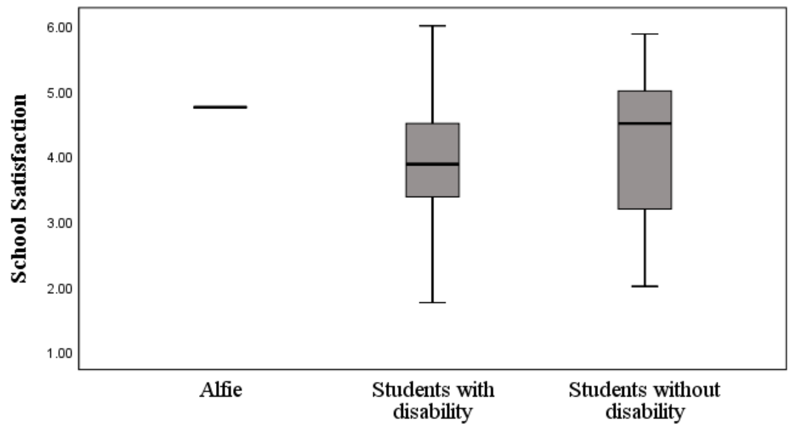
Box Plot Distributions for Scale Scores on Internal Responsibility for Failure for Alfie and Students with and without Disabilities



Alfie's School Satisfaction: Alfie's responses to the School Satisfaction scale indicated that he had a positive appraisal of school at the time of the study. In response to the statements of he feels 'bad at school' and 'there are many things about school [he does] not like', Alfie *more* disagreed than agreed. Alfie also *mostly* agreed with statements that contained positive feelings such as '[he likes] being in school', '[he enjoys] school activities', '[he looks] forward to going to school' and 'school is interesting'. Alfie's score for School Satisfaction (*M* = 4.75) was higher than the 75th percentile of distribution of median scores for students with disabilities (*M* = 3.82, *SD* = 1.19) and slightly higher than the median score for students without disabilities (*M* = 4.17, *SD* = 1.04) in Strand (Figure 6.6).

Figure 6. 6

Box Plot Distributions for Scale Scores on School Satisfaction for Alfie and Students with and without Disabilities



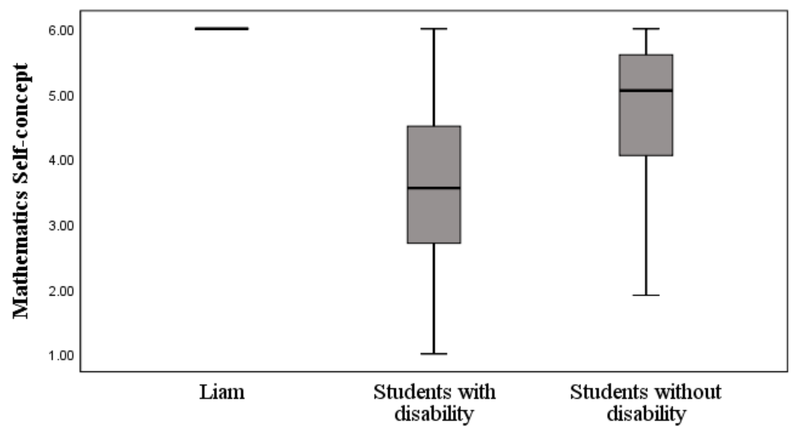
In summary, although Alfie perceived his mathematical capabilities positively, he had a negative perception of his English abilities and skills. He took more Internal Responsibility for his academic Success than Failure. Alfie's appraisal of School Satisfaction was positive.

Liam — At the time of the study, Liam was a 13-year-old student in Year 8. As reported by the stakeholders, Liam was a gifted student who had autism spectrum disorder, writing difficulties, and speech and language delay.

Liam's English, Mathematics, and General School Self-concepts: Liam's responses demonstrated that he had highly positive academic self-concepts in all three subscales of the Self Description scale, Mathematics, English and General School. For Mathematics Self-concept, Liam's self-ratings were at the maximum possible, indicating he perceived his mathematical abilities very positively. For example, he believed that the statements of 'maths is one of [his] best subjects', '[he looks] forward to maths classes', '[he enjoys] doing mathematics', '[he gets] good marks in maths', and '[he has] always done well in maths' were true. Liam's score of (*M* = 6) in Mathematics Self-concept was therefore at the maximum level of the distributions for both students with disabilities (*M*=3.41, *SD* = 1.42) and students without disabilities (*M* = 4.72, *SD* = 1.08) in Strand 1 (Figure 6.7).

Figure 6.7

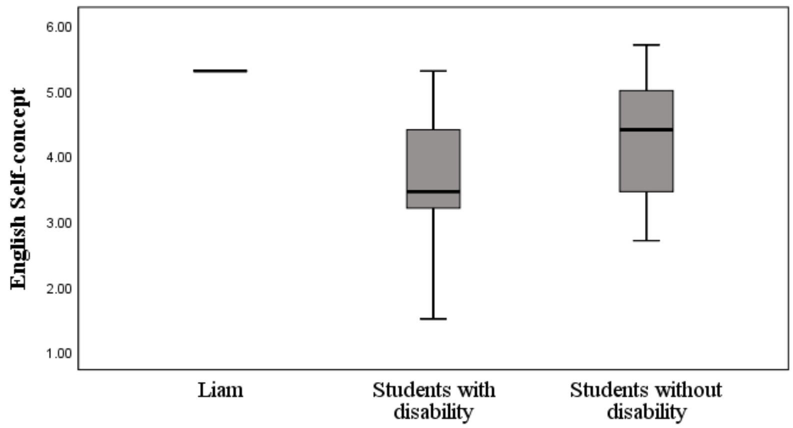
Box Plot Distributions for Scale Scores on Mathematics Self-concept for Liam and Students with and without Disabilities



Liam's English Self-concept was slightly lower than his Mathematics Self-concept, but he still held a very positive image. Liam perceived the statements of 'English is one of [his] best subjects', '[he looks] forward to English classes', and 'the work in English classes is easy for [him]' were *mostly* true. Interestingly, Liam's response to the statement '[he is] okay at reading' was more untrue than true, which might be related to his difficulties with language. However, Liam's score (*M* = 5.3) for English Self-concept was still in the highest 25 percent of scale scores for students without disabilities (*M* = 4.26, *SD* = .85) and at the highest level of distribution for students with disabilities (*M* = 3.59, *SD* = .94) in Strand 1 of the study (Figure 6.8). Furthermore, on perusal of the data for all student outcomes, no students with disabilities had higher scores than Liam. The English Self-concept score of only one student with disabilities (M = 5.3) was equivalent to that of Liam.

Figure 6. 8

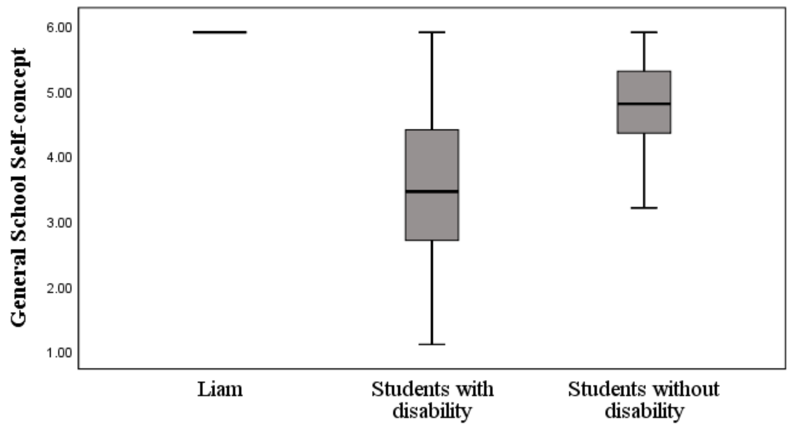
Box Plot Distributions for Scale Scores on English Self-concept for Liam and Students with and without Disabilities



Given Liam's positive evaluation of his mathematical and English capabilities, it was not surprising that he expressed a positive General School Self-concept. As Liam's responses showed, he believed that he 'learns things quickly in most school subjects' and 'does well in tests in most subjects' and, finally, if he 'works really hard, he could be one of the best students in school'. Findings showed that Liam's score (M = 5.9) in General School Self-concept was at the 95th percentile of the median distributions for both students with disabilities (M = 3.60, SD = 1.20) and students without disabilities (M = 4.75, SD = .71) who participated in Strand 1 (see Figure 6.9).

Figure 6. 9

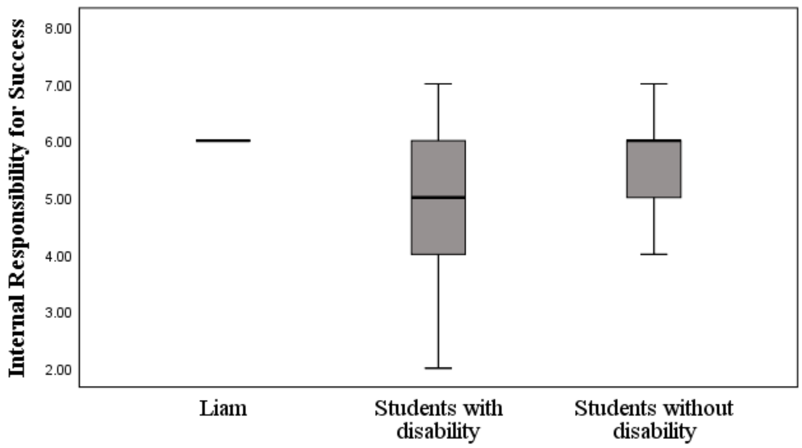
Box Plot Distributions for Scale Scores on General School Self-concept for Liam and Students with and without Disabilities



Liam's Academic Responsibility for Success and Failure: Liam's responses to the IAR scale demonstrated that he tended to take more Internal Responsibility for his academic Success than Failures. For example, Liam perceived if he 'did better than usual in a subject at school, it would probably happen because he tried harder' and 'if a teacher says to him, [his] work is fine, it is because [he] did a good job'. Further, the findings showed that Liam's score (I+ = 6) for this scale was approximately equivalent to the median score for students without disabilities (*M* = 5.60, *SD* = 1.16) and higher than the 75th percentile of the median distribution for students with disabilities (*M* = 5.09, *SD* = 1.30) in Strand 1 of this study (Figure 6.10).

Figure 6. 10

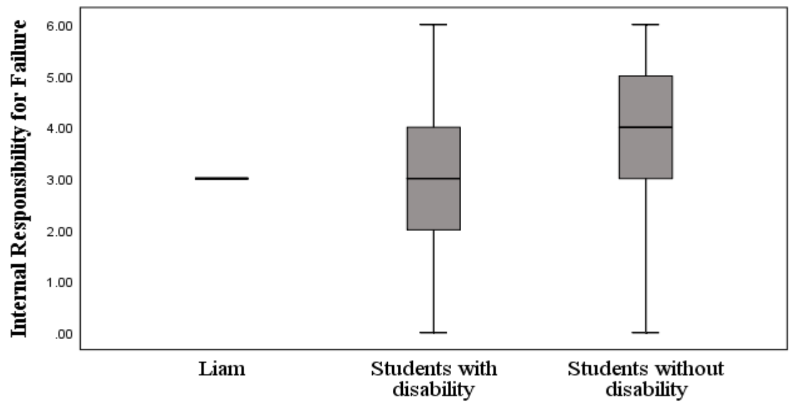
Box Plot Distributions for Scale Scores on Internal Responsibility for Success for Liam and Students with and without Disability



Liam had a tendency to consider academic failure to be due to external factors. For example, he believed if he ‘finds it hard to work maths problems at school, it is because the teacher gave problems that were too hard’, ‘when [he] has trouble understanding something in school, it is usually because the teacher didn’t explain it clearly’, and if [he] can’t do a puzzle, it is more likely to happen because the instructions weren’t written clearly’. Liam’s score for Internal Responsibility for Failure (I- = 3) was approximately equivalent to the median score for students with disabilities (M = 3.04, SD = 1.56) and lower than the median score for students without disabilities (M = 3.63, SD = 1.38) in Strand 1 (Figure 6.11).

Figure 6. 11

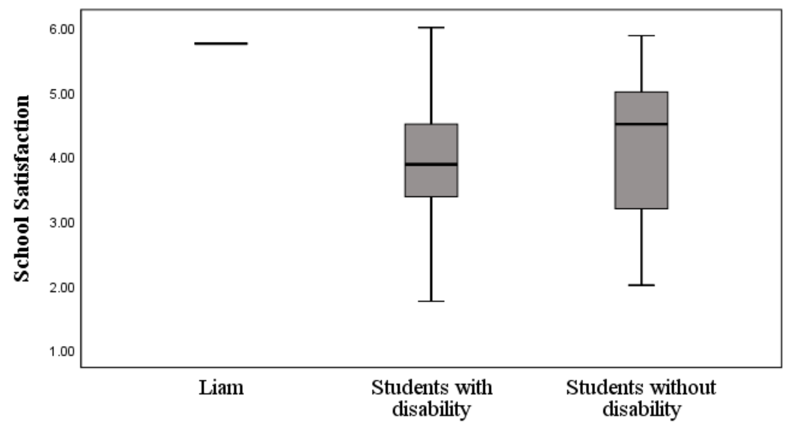
Box Plot Distributions for Scale Scores on Internal Responsibility for Failure for Liam and Students with and without Disabilities



Liam's School Satisfaction: Liam's responses to the School Satisfaction scale showed Liam was highly satisfied with school, at the time of this study. Liam strongly agreed with the statements of '[he likes] being in school', '[he learns] a lot at school', '[he looks] forward to going to school', and 'school is interesting'. Liam's School Satisfaction (6.00) was at the maximum level of median distributions for students with disabilities (*M* = 3.82, *SD* = 1.19) and students without disabilities (*M* = 4.17, *SD* = 1.04) (Figure 6.12).

Figure 6.12

Box Plot Distributions for Scale Scores on School Satisfaction for Liam and Students with and without Disabilities



In summary, Liam had very positive Mathematics and English Self-concepts. He tended to take more Internal Responsibility for Success than Failure. Liam was strongly satisfied with school.

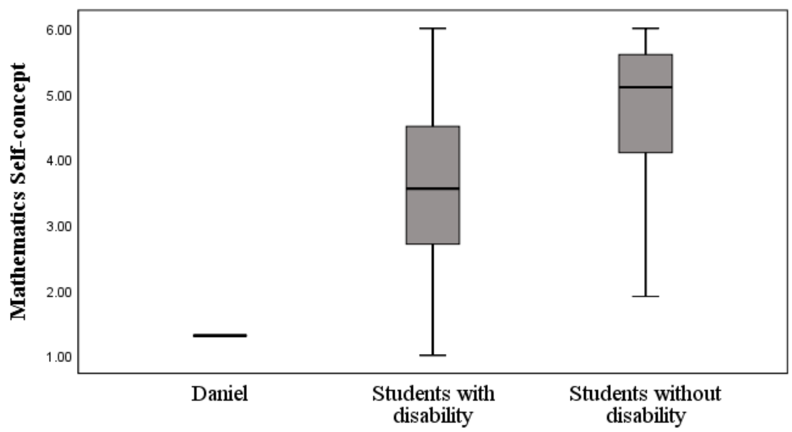
Daniel — At the time of this study, Daniel was a fifteen-year-old student in Year 9. Daniel had multiple disabilities, including learning difficulties, autism spectrum disorder, attention deficit/hyperactivity disorder, and speech and language impairment.

Daniel's English, Mathematics and General School Self-concepts: Daniel's responses to the academic subscales of the Self Description scale showed that he perceived his academic abilities *negatively.* In the subscale of Mathematics Self-concept, Daniel believed that the statements of '[he] often needs help in maths', '[he] has trouble understanding anything with maths in it', '[he] does badly in maths tests', '[he] hates maths', and '[he] never wants to take another maths course' were true. Daniel's score of Mathematics

Self-concept (*M* = 1.3) was approximately in the lowest level of median distribution for students with disabilities (*M* = 3.41, *SD* = 1.42) in Strand 1 of the study (Figure 6.13). Daniel's score was lower than the 95th percentile of the median distribution for students without disabilities (*M* = 4.72, *SD* = 1.08). This finding showed that Daniel strongly perceived his mathematical abilities negatively.

Figure 6.13

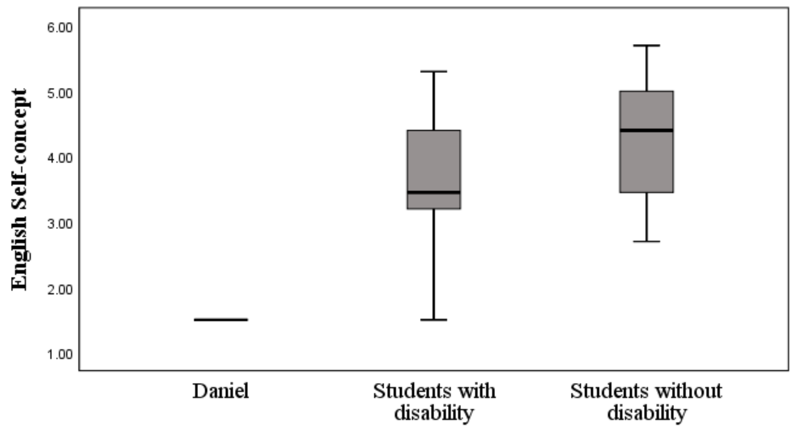
Box Plot Distributions for Scale Scores on Mathematics Self-concept for Daniel and Students with and without Disabilities



Daniel expressed a similar negative self-concept in English. Daniel's responses showed that he rated the statements of '[he was] hopeless in English classes', '[he does] badly on tests that need a lot of reading ability', '[he has] trouble expressing [him]self when [he tries] to write', '[he hates] reading' to be true. As shown in Figure 6.14, findings indicated Daniel's score for English Self-concept (*M* = 1.5) was lower than the minimum score for students without disabilities (*M* = 4.26, *SD* = .85). Additionally, Daniel's score in this subscale was in the 5th percentile of the median distribution for students with disabilities (*M* = 3.59, *SD* = .94) in Strand 1.

Figure 6. 14

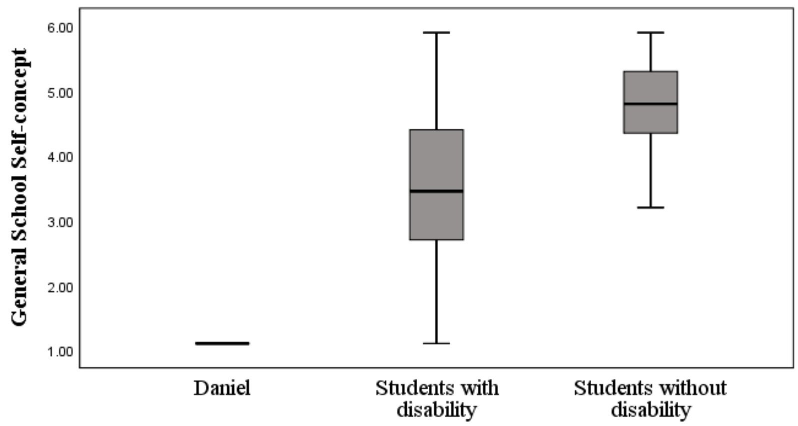
Box Plot Distributions for Scale Scores on English Self-concept for Daniel and Students with and without Disabilities



Given that Daniel had a negative self-concept in Mathematics and English, he would not be expected to have a positive General School Self-concept. Daniel's responses showed that he rated the statements of 'most school subjects are just too hard for [him]', '[he gets] bad marks in most school subjects', '[he thinks] I do not do well enough at school to get into university' as true. Daniel's score of General School Self-concept was in the 5th percentile of the distribution for students with disabilities (M = 3.60, SD = 1.20), while his score was even lower than the minimum score for students without disabilities (*M* = 4.75, SD = .71) in Strand 1 of the study (Figure 6.15).

Figure 6. 15

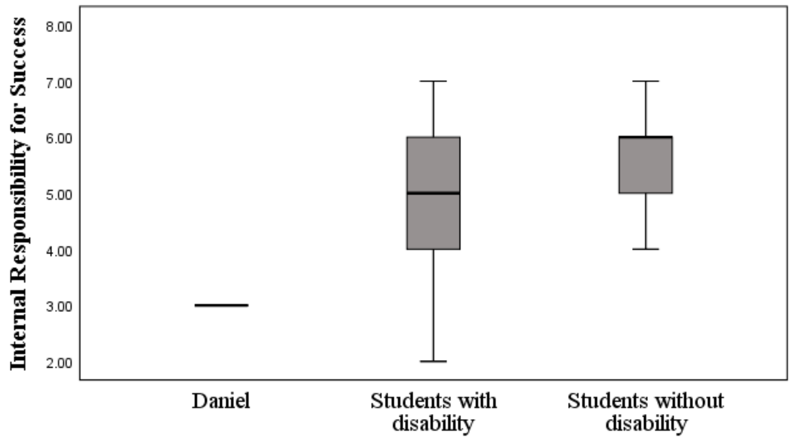
Box Plot Distributions for Scale Scores on General School Self-concept for Daniel and Students with and without Disabilities



Daniel's Academic Responsibility for Success and Failure: Daniel's responses to the IAR scale showed that, at the time of this study, he was less likely to take Internal Responsibility for academic Success. For example, Daniel believed if he 'did better than usual in a subject at school, it would probably happen because someone helped him' or when he does 'well on a test at school, it is more likely to be because the test was especially easy'. Findings also showed that his score (I+ = 3) in this subscale was in the lowest 25th percentile of the distribution for students with disabilities (*M* = 5.09, *SD* = 1.30) and lower than the minimum score for students without disabilities (I+ = 4) in Strand 1 (Figure 6.16).

Figure 6.16

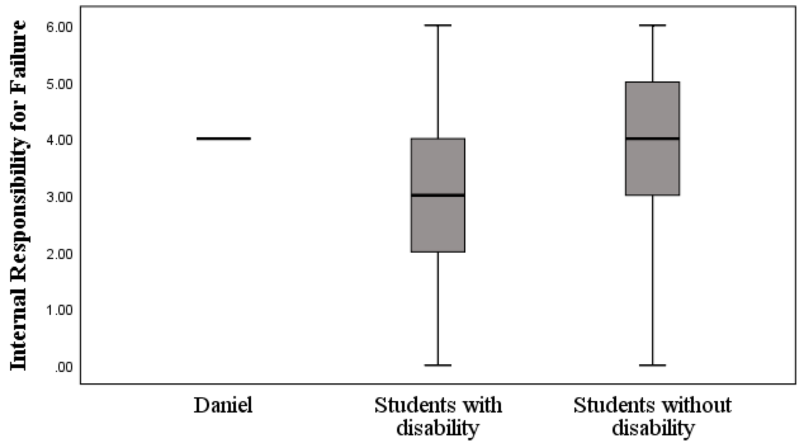
Box Plot Distributions for Scale Scores on Internal Responsibility for Success for Daniel and Students with and without Disabilities



Although Daniel tended to attribute his successes to external factors, he considered himself responsible for his academic failures. For example, Daniel deemed that if he 'finds it hard to work maths problems at school, it is because [he] didn't study well enough before he tried them' and when he 'has trouble understanding something in school, it is usually because [he] didn't listen carefully'. Daniel's score (I- = 4) in this scale was equivalent to the median score for students without disabilities (*M* = 3.63, *SD* = 1.38) and in the 75th percentile of median distribution for students with disabilities (*M* = 3.04, *SD* = 1.56) in Strand 1 (Figure 6.17).

Figure 6.17

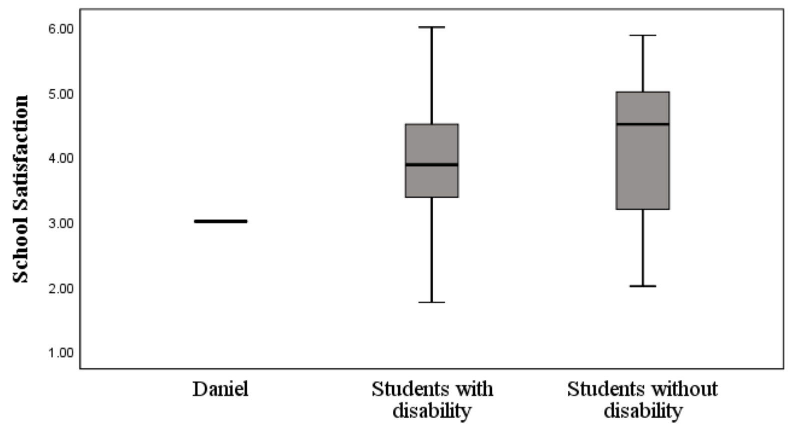
Box Plot Distributions for Scale Scores on Internal Responsibility for Failure Daniel and Students with and without Disabilities



Daniel's School Satisfaction: Daniel's responses to the School Satisfaction scale demonstrated that he was not satisfied with school, at the time of this study. Daniel *strongly* agreed with the statements of 'there are many things about school [he does] not like'. Further, Daniel's responses showed that he was *more* in disagreement than agreement with the statements '[he enjoys] school activities' and 'school is interesting'. Findings showed that Daniel's score of School Satisfaction was lower than the 25th percentiles of the distribution for students with disabilities (M = 3.82, SD = 1.19) and equivalent to 25th percentile for students without disabilities (M = 4.17, SD = 1.04) (Figure 6.18).

Figure 6.18

Box Plot Distributions for Scale Scores on School Satisfaction for Daniel and Students with and without Disabilities



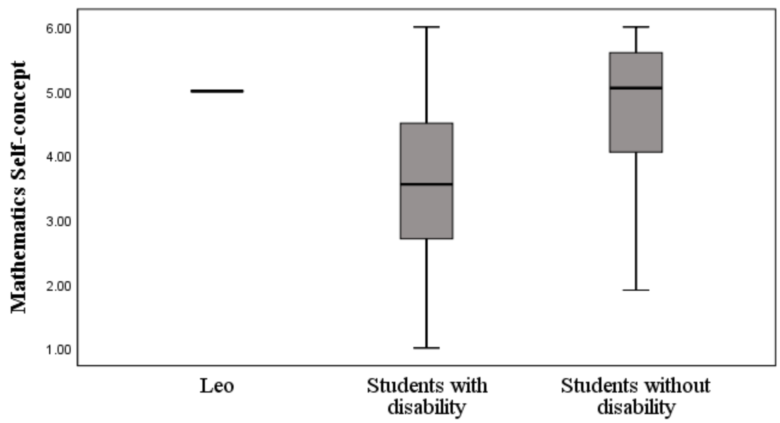
In summary, Daniel perceived his academic abilities very negatively, specifically in Mathematics and English. Daniel considered himself as the cause of his academic failure, while he attributed academic success to external factors, not his own efforts. Daniel was not satisfied with school.

Leo — At the time of the study, Leo was a 12 year 8-month-old student in Year 7. Leo had speech and language impairment, auditory processing disorder, and learning disabilities (e.g., spelling difficulties, reading comprehension).

Leo's English, Mathematics and General School Self-concepts: Leo's responses to the academic subscales of the Self Description scale showed that Leo had higher scores in Mathematics and General School Self-concepts compared with his English Self-concept. For the subscale of Mathematics Self-concept, Leo identified the statements of 'maths is one of his best subjects', 'I look forward to maths classes', 'I enjoy doing maths', 'I get good marks in maths' as true. Leo's Mathematics Self-concept (M = 5) was higher than almost the 75th percentile of the distributions for students with disabilities (*M* = 3.41, *SD* = 1.42) and approximately equivalent to the median score for students without disabilities (*M* = 4.72, *SD* = 1.08) participating in Strand 1 of this study (Figure 6.19).

Figure 6.19

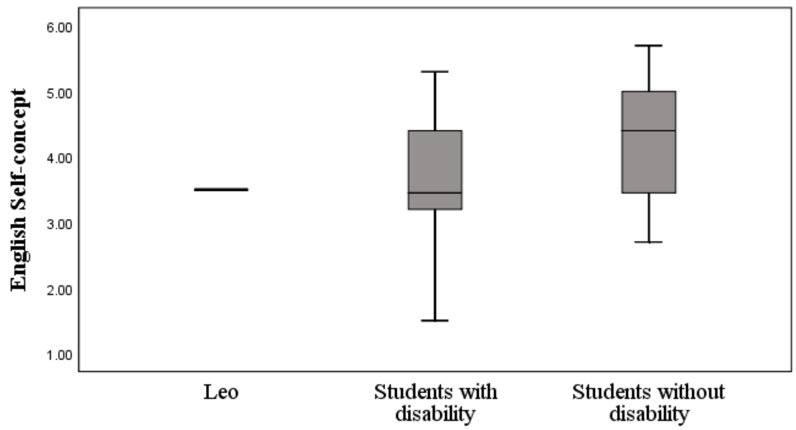
Box Plot Distributions for Scale Scores on Mathematics Self-concept for Leo and Students with and without Disabilities



In the subscale of English Self-concept, Leo perceived himself as a student who learned 'things quickly in English' and could achieve 'good marks'. However, he indicated that the statements of 'I have trouble expressing myself when I try to write', 'I am hopeless in English classes' and 'I hate reading' were true. As shown in Figure 6.20, Leo's score (*M* = 3.5) in the subscale of English Self-concept was approximately equivalent to the median score for students with disabilities (*M* = 3.59, *SD* = .94) and in the 75th percentile of median distributions for students without disabilities (*M* = 4.26, *SD* = .85) in Strand 1 of this study.

Figure 6. 20

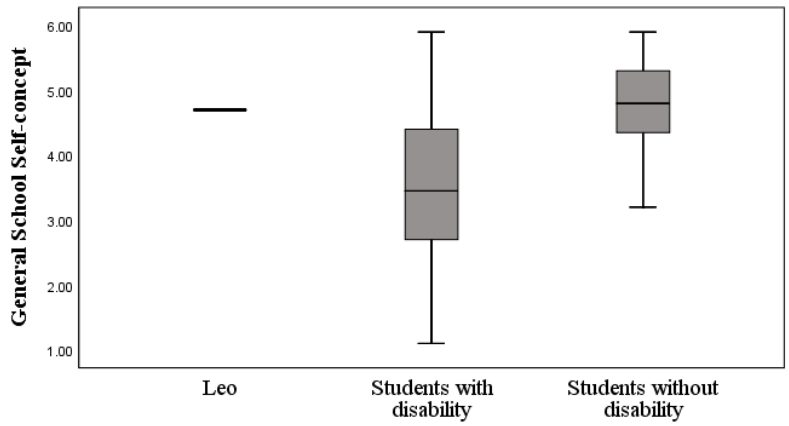
Box Plot Distributions for Scale Scores on English Self-concept for Leo and Students with and without Disabilities



The findings showed that Leo had a positive General School Self-concept. Leo positively rated the statements of ‘I learn things quickly in most school subjects’, ‘if I work really hard, I could be one of the best students in my school’, ‘I am good at most school subjects’ and ‘I do well in tests in most subjects’. Leo’s score (M = 4.7) on this self-concept was approximately equivalent to the median score for students without disabilities (M = 4.75, SD = .71) and higher than the 75th percentile of the distribution for students with disabilities (M = 3.60, SD = 1.20) (Figure 6.21).

Figure 6. 21

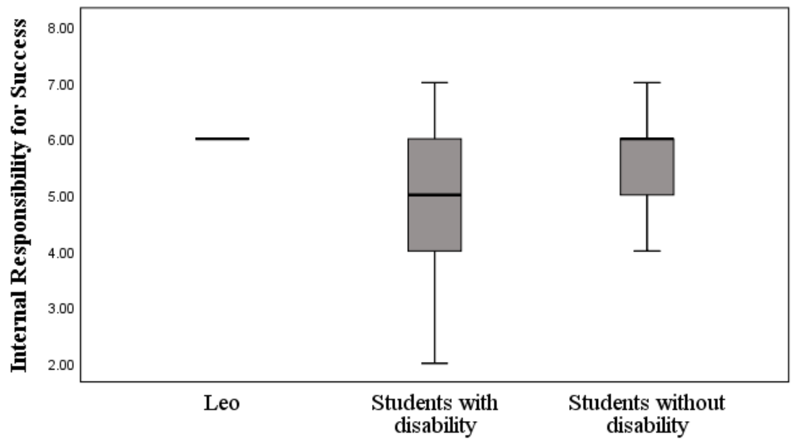
Box Plot Distributions for Scale Scores on General School Self-concept for Leo and Students with and without Disabilities



Leo's Academic Responsibility for Success and Failure: Leo's responses to the Intellectual Achievement Responsibility Scale demonstrated that he tended to take Internal Responsibility for Success. For example, Leo believed 'when [he does]well on a test at school, it is more likely to be because [he] studied for it' and 'if a teacher says to [him], "[his] work is fine", it is because [he] did a good job'. Leo's score (I+ = 6) in this subscale was approximately equivalent to the median score for students without disabilities (*M* = 5.60, *SD* = 1.16) and almost equivalent to the 75th percentile of the distribution for students with disabilities (*M* = 5.09, *SD* = 1.30) in Strand 1 (Figure 6.22).

Figure 6. 22

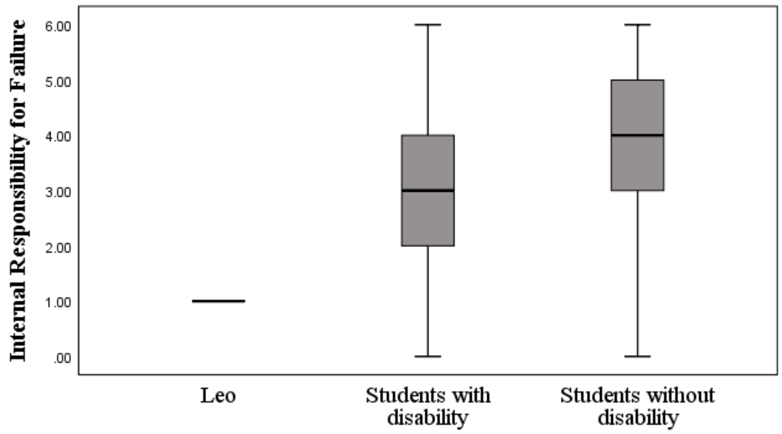
Box Plot Distributions for Scale Scores on Internal Responsibility for Success for Leo and Students with and without Disabilities



By contrast, Leo was less likely to attribute academic failures to himself. For example, in response to the statements such as if he 'find[s] it hard to work maths problems' and '[has] trouble understanding something', Leo tended to consider factors such as task difficulty, unclear instruction and classroom distractions as the causes of failure. Correspondingly, as shown in Figure 6.23, the findings indicated Leo's score (I- = 1) for this subscale was in the low 25th percentile of distributions for both students with disabilities (*M* = 3.04, *SD* = 1.56) and students without disabilities (*M* = 3.63, *SD*= 1.38) in Strand 1 of the study, suggesting that Leo strongly tended to attribute academic failures to external factors, rather than as his own responsibility.

Figure 6.23

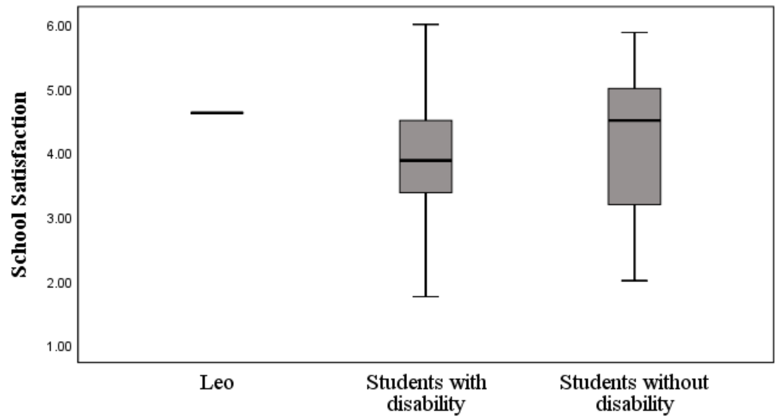
Box Plot Distributions for Scale Scores on Internal Responsibility for Failure for Leo and Students with and without Disabilities



Leo's School Satisfaction: Leo's responses to the School Satisfaction scale demonstrated that he was satisfied with school at the time of this study. Leo indicated that he *strongly* agreed with the statements of 'I like being in school', 'I learn a lot at school', and 'school is interesting'. However, in the statement, 'I wish I didn't have to go to school', he rated his response 'more agree than disagree'. Furthermore, as shown in Figure 6.24, Leo's score for School Satisfaction (*M* = 4.62) was almost equivalent to the median score for students without disabilities (*M* = 4.17, *SD* = 1.04) and in approximately 75th percentile of the distribution for students with disabilities (*M* = 3.82, *SD* = 1.19) in Strand 1 of the study.

Figure 6. 24

Box Plot Distributions for Scale Scores on School Satisfaction for Leo and Students with and without Disabilities



In summary, Leo had positive Mathematical and General School Self-concepts. Leo's English Self-concept score was lower than for his Mathematics Self-concept but fell in the average range. He was more likely to take Internal Responsibility for Success than Failure. Leo had a positive appraisal of school.

Overall findings for the students' academic well-being

Overall, three students — Alfie, Liam, Leo — perceived their academic achievement positively. The students had more positive Mathematics Self-concept than English Self-concept. In terms of academic responsibility, the students tended to take more Internal Responsibility for Success than Failure. However, Daniel had a negative perception of his academic capabilities, specifically in Mathematics and English. He also had a totally different perception of the causes of academic success and failure. Daniel had a low internally-oriented responsibility for success and considered external factors as the causes of academic success.

For School Satisfaction, Alfie, Liam, and Leo rated themselves satisfied with school, while Daniel showed a negative appraisal of his school experiences. This different attitudinal pattern between Daniel and the other three students might be related to the severity of his multiple disabilities. The findings for the academic wellbeing of each case study student as well as their achievement outcomes in Mathematics and English are represented in Table 6.1. The students' achievement outcomes were provided by the participating teachers, with the outcomes of the focus assessment tasks discussed in Chapter 5 highlighted in Table 6.1.

Table 6. 1

Summary of Qualitative Findings for Academic Achievement and Academic Wellbeing

Variables	Alfie	Liam	Daniel	Leo
Mathematics Self-concept	Positive	Positive	Negative	Positive
Mathematics grade	A	A+	N/A	A
English Self-concept	Average	Positive	Negative	Average
English grade	C	A	Level 4-5	B-
IR-success	Internal	Internal	External	Internal
IR-failure	External	Middle	Internal	External
School Satisfaction	Satisfied	Satisfied	Dissatisfied	Satisfied

Note. IR: Internal Responsibility for Success

6.2.2. Addressing the Research Question (5): How does academic achievement under adjusted conditions relate to academic wellbeing (academic self-concept, academic responsibility, school satisfaction) of secondary students with disabilities?

As reported in Chapter 5, Alfie's and Liam's teachers provided information on adjustments in Mathematics assessment tasks, while Daniel's and Leo's teachers provided information on adjustments in English assessment tasks. The case study students' grades in Mathematics and English under adjusted conditions were addressed in relation to their scores in the components of academic wellbeing. Generally, the higher scores showed the students had positive self-concepts, were satisfied with school and took Internal Responsibility for academic Success and Failure. First, Alfie's and Liam's Mathematics Achievement in relation to academic wellbeing in regard to the implemented adjustments is addressed. Second, findings drawn from the relationship between English Achievement and academic wellbeing under adjusted situations for Leo and Daniel are presented.

Mathematics achievement, adjustments to mathematics assessment tasks, and mathematics self-concept: As noted in Chapter 5, Liam and Alfie demonstrated a high level of mastery in mathematics. This implies they can demonstrate the target skills of Mathematics assessment if they have full access to assessment tasks. Alfie had functional impairments in writing skills (e.g., difficulties with spelling, coherent writing). Writing skill was not in the list of the target skills that were assessed in the Mathematics assessment. Therefore, to eliminate barriers relating to Alfie's access skills impairment, he was allocated a scribe. Extra time and a separate room were allowed to accommodate the use of a scribe. Findings showed that Alfie's Mathematics grade improved from D- in Term 1 to A in Term 2 under an adjusted situation.

Liam was a gifted student identified as having autism spectrum disorder as well — a twice-exceptional student. To remove barriers relating to access skills, Liam responded verbally to some parts of the assessment and typed the rest of the task. To enable Liam to show his high-level abilities in Mathematics, he was provided with an extension task that he completed using Excel. Liam achieved the highest score, A+, of students in the classroom.

The above two examples demonstrated that when the assessment task was made fully accessible, the students with disabilities were capable of showing their knowledge in the target skills of the assessment. In Liam's case, the provision of adjustments was not limited to eliminating educational barriers but created greater opportunities for the student to challenge their high-level abilities. Liam and Alfie reflected in their surveys that the selected adjustments helped them better demonstrate their mathematical abilities. Overall, the Mathematics Achievement of the students positively connected to the provided adjustments within mainstream classrooms.

In terms of Mathematics Self-concept, Liam and Alfie had high scores, which showed that they perceived their mathematical capabilities and skills very positively. In confirmation of this finding, Alfie's teacher stated that Alfie learned new mathematical concepts and skills more quickly than most of his classmates. Liam and Alfie indicated in their surveys that they were 'very confident' about their learning and achievement in Mathematics. Furthermore, Alfie and Liam's levels of Mathematics Self-concept were almost equivalent and higher, respectively, when compared with students without disabilities in Strand 1 of the study. Similarly, in subscale of General School Self-concept, both students perceived their overall academic abilities positively. Overall, high Mathematics Achievement was strongly related to a positive Mathematics Self-concept, and this relationship was enhanced by providing tailor-made adjustments. How the provided adjustments for Alfie and Liam acted as a catalyst for fostering the relationship between Mathematics Achievement and Mathematics Self-concept is discussed in Chapter 7.

Mathematics achievement, adjustments to the mathematics assessment, academic responsibility: For the Intellectual Achievement Responsibility Scale, Alfie (I+=7) and Liam

(I+=6) identified strong internally-oriented responsibility for academic success. For example, in this subscale, these students considered that if they 'did better than usual in a subject at school, it would probably happen because [they] tried harder'. Liam's mother pointed out Liam's learning attributes and stated Liam was a hard-working, organised student who was able to understand Mathematics well and achieve very good marks academically. Liam also said, "I am an A+ student and persistent with Maths and will show all my working out." Similarly, Alfie's mother mentioned that Alfie was an intelligent and hardworking student. Alfie's teacher also stated that Alfie understood new mathematical concepts quickly and discussed them well. Additionally, Alfie felt confident about learning and understanding Mathematics. The individual characteristics (i.e., effort, high learning potential) mentioned reflect that these students have an internal orientation to attribute success to themselves. The students' high achievement in Mathematics and their high score in Internal Responsibility for Success may reflect that these variables are positively related to each other.

Mathematics achievement, adjustments to the mathematics assessment, school satisfaction: Liam's and Alfie's School Satisfaction scores showed that they were satisfied with school. Further, both of Liam's and Alfie's scores for School Satisfaction were higher than the median scores of students without disabilities in Strand 1 of the study. A positive appraisal of school experiences is associated with high Mathematics Achievement. This relationship may be affected by the students' experiences of the provided adjustments. For example, Alfie's teacher stated that Alfie told her after the assessment that he felt "very positive" and that it was easier to work with a scribe. This adjustment ensured that the student could undertake his task 'on the same basis' as classmates without disabilities and be satisfied with his school experiences.

Overall, despite Alfie and Liam being identified as having disabilities, they did not perceive their mathematical abilities differently from students without disabilities, which may suggest that the use of adjustments met their special needs in Mathematics. It seems provision of classroom adjustments, by removing barriers related to access skills required for doing the Mathematics task, has provided opportunities ‘on the same basis’ for these students with disabilities to achieve success. The students’ Mathematics Achievement under adjusted conditions, promoted their Mathematics Self-concept, Internal Responsibility for Success and School Satisfaction.

English achievement, adjustments to the English assessment task and English self-concept: English was the focus of assessment for two case study students, Leo and Daniel. As noted in Chapter 5, Leo had difficulties using accurate spelling, grammar, and punctuation, which were assessed as target skill components of the English assessment. Leo’s considerable difficulties with writing skills were evidenced in his History assessment. Leo’s English task was not assessed differently from other classroom students, and he was reported to undertake the task by himself, that is, without assistance. Leo’s mother noted that no adjustment was provided to Leo, but if Leo had difficulty understanding assessment requirements, the teacher gave “additional explanation and direction”. Leo’s teacher also reported that Leo could work independently if instructions were explicit. Leo reported that the teacher assisted him to correct some sentences grammatically during the assessment. Leo achieved a B- in the English assessment. Collectively, the minimal support that the student received in the English assessment contributed to his English grade.

Leo perceived his English academic abilities less positively than his mathematical abilities. Leo’s English Self-concept score was lower than that of students without disabilities in Strand 1 but fell in the average range (*M* = 3.5). A score between 3 and 5 shows a student has an average academic self-concept. Leo's perception of his English capabilities clearly reflects the challenges he faced in his English task. In Leo's case, the level of English Achievement was closely related to his level of English Self-concept. In alignment with this finding, Leo stated that his English Achievement in primary school was "okay", but in high school was "good". Leo's description of his English Achievement reflected that his perception of his English abilities had improved positively over time, which may relate to the provided adjustments. In the subscale of General School Self-concept, Leo showed that he had a positive perception of his overall academic abilities, comparable with the level of General School Self-concept for students without disabilities in Strand 1.

As reported in Chapter 5, Daniel was identified as having autism spectrum disorder, attention deficit/ hyperactivity disorder, learning difficulties, and language impairment. The student had significant functional impairments in both access and target skills and therefore the English assessment task was modified to his non-age-related level of achievement. The adjustments included a modified grading rubric, reduced workload, and the use of a computer, and a teacher aide. The provision of adjustments assisted Daniel to achieve the middle of level 4 in the English assessment. However, this level of achievement implies that Daniel was academically 4 years behind his same-age peers, which may affect his academic self-concept.

Daniel perceived his academic capabilities very negatively, specifically in Mathematics and English. For example, in the subscale of English Self-concept (*M* = 1.5), Daniel indicated that 'the work in English classes is not easy', and he was 'hopeless in English classes'. Further, Daniel had the lowest level of English Self-concept among the case study students and students with and without disabilities in Strand 1 of the study. The English

Self-concept score of only one student with disabilities in Strand 1 was the same as that of Daniel. Findings for Daniel's case indicates that his low level of English Achievement was strongly related to negative English Self-concept. Daniel's mother reported that Daniel "is well behind his peers in all areas of reading, writing and mathematics". Further, in the subscale of General School Self-concept, Daniel showed that he perceived his overall abilities negatively.

The provision of the various adjustments, to some extent, enhanced Daniel's achievement but did not help him improve his perception of his English abilities. In confirmation of this finding, Daniel reported that although he was assessed differently from his peers in English tasks, he "still struggled to get good results" and his English Achievement was "below average". In Chapter 7 I discuss why**,** despite the different adjustments that the student received, his English Self-concept may have remained negative will be discussed.

English achievement, adjustments to the English assessment task and academic responsibility: Findings showed that Daniel and Leo had a different orientation to academic responsibility. Leo's total score (I+ = 6) showed that he tended to take Internal Responsibility for academic Success. Leo's mother described Leo as a hardworking person. Leo's teacher reported that Leo "can perform a skill well once it has been learned and practised" and can work independently. The teacher's description may denote that Leo does better at tasks when he can work at his own pace. Overall, Leo's English Achievement was connected to Internal Responsibility for Success.

However, Daniel's score (I+ = 3) indicated that he had a low internal orientation for success. Daniel does not think that he has any ability, and if he does well it is due to external factors. Although Daniel was able to achieve at a certain level in English under an adjusted situation, he did not perceive it as a good outcome because he is aware that he is below the level of his peers. Daniel (I- = 4) perceived internal factors as reasons for academic failure. Daniel may deem that his learning challenges prevent him from having any academic success. Daniel's mother stated that Daniel had severe learning difficulties, and he would achieve the lowest level of achievement if a standard grading rubric was used.

Overall, whereas Leo tended to attribute academic success to internal factors, Daniel considered external factors were the reason for any academic success. Inversely, Leo took externally oriented responsibility for failure, while Daniel attributed internal factors to academic failure. A positive relationship was found between English Achievement and internal responsibility for academic success in Leo's case only. The severity and the student's multiple disabilities, followed by the substantial level of support needs, may affect the student's perception of academic success and failure.

English achievement, adjustments to English assessment tasks, and school satisfaction: Leo indicated general satisfaction with school. Leo's score (M = 4.62) was higher than the score of students without disabilities (M = 4.17) in Strand 1 of the study. In agreement with this finding, Leo's English teacher reported that Leo was highly engaged in classroom activities. As shown in Table 6.1, Leo's English and Mathematics Achievement were higher than the expected achievement standard in Year 7. Additionally, Leo's teacher provided the student's work sample in the History assessment for this study, reported in Chapter 5. The History assessment task was adjusted using sentence starters, and Leo achieved an A in Term 4. However, he had achieved D under an unadjusted situation in Term

1. It is possible that more successful experiences, coupled with classroom assessment adjustments, related to Leo's School Satisfaction.

By contrast, Daniel's score showed that he did not have a positive appraisal of school. For example, Daniel indicated, 'there are many things about school [he does] not like'. Daniel's School Satisfaction's score was considerably lower than those of both students with and without disabilities in Strand 1 of the study. Daniel reported that he got quickly bored in the classroom. Similarly, Daniel's teacher stated that Daniel was not sometimes interested and "reluctant to have a go". The implemented adjustments improved Daniel's English Achievement, but his perception of the school experience was not enhanced. Overall, Leo's academic achievement was positively related to School Satisfaction, and this relationship may be affected by the implemented adjustments for him. In Daniel's case, the level of English Achievement (L 4-5) related to the low level of School Satisfaction. This signifies that the provided adjustments have not led to a successful experience that affects the student's appraisal of school.

6.2. Chapter Summary

The purpose of this study's qualitative strand was to investigate Mathematics and English Achievement in relation to academic wellbeing across the four students with disabilities. Liam's, Alfie's and Leo's Mathematics and English Achievement, in the adjusted situation, were higher than the expectations of achievement (Queensland Curriculum, Assessment Authority; QCAR, 2020) across Years 7 to 9. However, the level of achievement for Daniel was considerably lower than his same-age peers in Year 9. Mathematics and

English Achievement interconnected with classroom assessment adjustments across the four students with disabilities.

In terms of academic self-concept, the qualitative findings for three students, Alfie, Liam and Leo, demonstrated that Mathematics and English Achievement were consistently related to Mathematics and English Self-concepts, respectively. The students, Alfie and Liam, with high Mathematics Achievement, had positive Mathematics Self-concept, which might be related to the adjustments that they received that enabled them to demonstrate this level of achievement. Similarly, Leo's perception of his English abilities was connected to his English grade. In the case of Daniel, his low level of English Achievement, relative to peers, was related to negative English Self-concept. A substantial level of classroom adjustments improved Daniel's English Achievement but did not lead to formation of a positive English Self-concept.

In terms of academic responsibility, three case study students, Alfie, Liam and Leo, showed that they tended to take Internal Responsibility for Success. However, Daniel perceived that the achieved success was related to external factors. Mathematics and English Achievement were related to Internal Responsibility for Success for Alfie, Liam and Leo. However, this relationship was not found in Daniel's case.

Finally, findings indicated that School Satisfaction for the three case study students, Alfie, Liam, and Leo, was positive. Further, Mathematics and English Achievement under adjusted conditions were associated with positive school appraisal. However, despite access to the different types of adjustments in Daniel's case, he had low satisfaction with school. These findings are discussed further in Chapter 7, Discussion, to understand how the provision of adjustments improves the relationship between academic achievement and academic wellbeing for students with disabilities. Further, the complementarity of the research methods used in this study to address the research questions, with synthesis of findings is also discussed in Chapter 7.

CHAPTER 7: Findings and Discussion of the Mixed Method Study

7.0. Overview

This mixed methods study was conducted to examine academic achievement in relation to the academic wellbeing of Australian secondary school students with and without disabilities and further, to explore how academic achievement relates to assessment adjustments and academic wellbeing of students with disabilities.

This chapter describes key findings that emerged from the quantitative and qualitative strands of the study and discusses their significance in relation to previous studies through a social-cognitive lens. In this chapter, the gap identified in the literature relating to academic achievement, academic wellbeing and classroom assessment adjustments is re-addressed to gain new insights into how academic achievement and wellbeing are related for students with disabilities in inclusive education settings; and the study's contributions to assessment practice in inclusive setting are presented.

The study is framed within **social-cognitive theory** (Bandura, 1982). According to social-cognitive theory, learning is a result of three interacting sets of factors: personal, behavioural and environmental. Each set of factors affects the others and is in turn affected by them. In this dynamic conceptualisation, academic achievement is a behavioural factor that affects academic self-concept, academic responsibility and school satisfaction (personal factors) and environmental factors (e.g., social comparison) and in turn is affected by these. Further, and consistent with a social-cognitive lens, in this study, disability is considered as an activity restriction created through the interactions between health conditions, student disabilities, student-related psychosocial factors (personal factors) and educational barriers (environmental factors), as described in the **biopsychosocial model of disability** (World Health Organization [WHO], 2002). The International Classification of Functioning, Disability and Health (ICF; WHO, 2002) has taken this model as the new direction for disability models. The provision of classroom assessment adjustments in the implementation of inclusive education is an environmental factor intended to eliminate or reduce barriers that limit student abilities to demonstrate their knowledge (Dembitzer & Kettler, 2018).

The **parallel mixed methods design** (Teddlie & Tashakkori, 2009) used in this study consisted of two strands with data gathered from two distinct groups of participants. Strand 1 of the study, reported in Chapter 4, examined relationships and differences between academic achievement and academic wellbeing for Australian students with and without disabilities. In this Strand of the study, three research questions were addressed:

> *Research Question 1:* What is the relationship between academic achievement and academic well-being (academic self-concept, academic responsibility, school satisfaction) for Australian secondary students with and without disabilities?
>
> *Research Question 2:* Are there differences in academic achievement and academic well-being (academic self-concept, academic responsibility, school satisfaction) between secondary students with and without disabilities?
>
> *Research Question 3:* Are there differences in academic achievement and academic well-being (academic self-concept, academic responsibility, school satisfaction) across the NCCD levels of implemented adjustments for secondary students with disabilities?

In the first section of the qualitative research undertaken in Strand 2, reported in Chapter 5, a qualitative case study approach was used to investigate how teachers adjusted assessment tasks for four students with disabilities. Adjustments were considered in terms of changes addressing difficulties in **access** and **target** skills related to the case study students' disabilities (Dembitzer & Kettler, 2018), alignment with intended learning and tasks (Tomlinson & Moon, 2013), and validity (Sireci, 2008). Furthermore, the perceptions of the case study students, parents, and teachers were explored to investigate how achievement outcomes in focus subject areas related to the implemented adjustments. This section of the study addressed the following research question:

Research Question 4: How does academic achievement relate to selected adjustments to classroom assessment for secondary students with disabilities?

In the second section of Strand 2 of the study, reported in Chapter 6, a cross-case analytical approach was applied to investigate academic achievement under adjusted conditions in relation to academic wellbeing across the four case study students in two subject areas — Mathematics and English. Academic wellbeing for the case study students was considered in terms of their own perceptions, as well as in comparison to the findings from Strand 1 of the study with a larger sample of Australian students with and without disabilities. The following research question was addressed:

Research Question 5: How does academic achievement under adjusted conditions relate to academic wellbeing (academic self-concept, academic responsibility, school satisfaction) of secondary students with disabilities?

Discussion of the findings of this study is presented in two sections. The following section discusses the results reported in the previous chapters in terms of the research questions and presents the contributions to inclusive education assessment practice. In the final section, the findings of quantitative and qualitative strands are synthesised and integrated to provide key findings.

7.1. Addressing the Research Questions

Research Question 1: **What is the relationship between academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) for Australian secondary students with and without disabilities?**

Overall, the findings of Strand 1 of the study reflected previous Australian and international research outcomes regarding the relationship between academic achievement and academic wellbeing. The findings add to previous research by examining relationships between academic achievement and domain-specific (Mathematics, English) academic self-concept, as well as General School Self-concept, and the relationships of these discipline-specific outcomes with other aspects of academic wellbeing.

Academic achievement and academic self-concept: The findings of Strand 1 of the study for all participants, both students with and without disabilities indicated that Mathematics Achievement was positively associated with Mathematics Self-concept. Similarly, a positive relationship was found between English Achievement and English Self-concept. Mathematics and English achievements were highly correlated (r =. 68), while the correlation between Mathematics and English self-concepts was weaker (r =. 24). These findings, therefore, confirmed for Australian participants the relationship between domain-specific academic self-concept and the related academic achievement that has been well documented in many international studies (Fu et al., 2020; Möller et al., 2020; Susperreguy et al., 2018; Wu et al., 2021).

Previous research (Brabcová et al., 2015; Zhang, 2016) has shown that having a disability is linked to lower levels of academic self-concept in Mathematics and English, so this was examined as a component of Research Question 1. In the group of students without disabilities, Mathematics and English Achievement were positively related to Mathematics and English self-concepts respectively.

For students with disabilities in this study, Mathematics Achievement and Mathematics Self-concept were positively associated. However, no significant relationship was found between English Achievement and English Self-concept. These findings contrast with those of Möller et al. (2009) who found that both mathematics achievement and mathematics self-concept (r = .51) and German language achievement and German language self-concept (r = .34) were correlated for students with disabilities in special education settings. However, this study's findings are similar to those of McCauley et al. (2018) who found mathematics self-concept was related to problem-solving abilities and numerical operations in students with and without autism spectrum disorder, but reading self-concept was only related to performance on reading tasks for students without disabilities. McCauley et al. pointed out that students may evaluate their Mathematics abilities based on getting a 'correct' answer in mathematics assessment tasks, while in reading assessment tasks, students may find it more difficult to determine their competency due to the less clear way in which feedback for reading tasks is typically given.

The lack of relationship between English Achievement and the corresponding self-concept for students with disabilities may be discussed in terms of the nature of the subject assessment. English, as a subject, typically includes a combination of learning materials (e.g., novels, biographies), modes of interaction (oral, reading, writing, presentation) and skills (e.g., reading, grammar, comprehension). However, mathematical concepts and skills (e.g., problem-solving exercises) are more specifically defined in curriculum. Therefore, subject specificity could moderate the relationship between domain-specific self-concept and the corresponding achievement. Further, the literacy demands of assessments in mathematics are different from those facing students in assessments in English, as identified by Wyatt-Smith and Cumming (2003). These authors trace the differences to the influences of the curriculum on what is expected in demonstrations of knowledge and skills required in learning the curriculum and what is counted in the curriculum as valued assessment expectations (Wyatt-Smith & Cumming, 2003).

For the group of students with disabilities, a weak positive association was found between English Achievement and Mathematics Self-concept. For many students with disabilities, their disabilities lie in literacy or language resulting in a potential language impact on their Mathematics Achievement. Furthermore, findings of Strand 1 of the study showed that English and Mathematics Achievement were strongly related to General School self-concept for both groups of students, with and without disabilities. In line with social-cognitive theory (Bandura, 1986), when students feel academically competent, their beliefs act as a booster for motivating them to engage in activities that help to improve their academic achievement.

Academic achievement and academic responsibility: The findings of Strand 1 of the study showed a weak relationship between Mathematics Achievement and Internal Responsibility for Success but not for English Achievement, when students with and without disabilities were considered jointly. No relationship was found between Mathematics and English Achievement and Internal Responsibility for Failure. Additionally, a significant relationship between Mathematics or English Achievement and Internal Responsibility for Success and Failure did not eventuate for the individual groups, that is, students with and without disabilities.

Little is known about the relationship between specific-subject academic achievement and academic responsibility. It has been noted that a high external locus of control might be damaging in relation to academic achievement, but a high internal locus of control might not strongly affect academic achievement (Anderson et al., 2005). Conversely, in a recent study on locus of control and the mathematics and reading achievement of students with disabilities (Park et al., 2020), academic achievement was positively related to an internal locus of control. Park et al. considered that when students with disabilities have successful academic experiences, they may perceive that their outcomes are in their control. Thus, this may enhance their effort to undertake school activities, despite the educational barriers that these students encounter (Park et al., 2020). Similarly, research has shown that students who consider themselves responsible for their achievement outcomes have higher academic achievement (Akunne & Anyanmene, 2021; You et al., 2011). It is important to note that the reliability of the subscale of Internal Responsibility for Success was low in this study. Therefore, interpretations of findings for students' academic responsibility should be made with caution.

Academic achievement and school satisfaction: Average School Satisfaction (MSLSS; Huebner, 1994) fell in the positive range (above the average potential score) for students both with and without disabilities in this study. Researchers have found a range of outcomes for school satisfaction and students with and without disabilities, as discussed in Chapter 2. The findings of this study are consistent with the findings for School Satisfaction

(MSLSS; Huebner, 1994) in McCullough and Huebner's (2003) study that found adolescent students with and without learning disabilities expressed positive school satisfaction.

The finding in this study of a positive level in students' School Satisfaction is of importance as previous international research evidence has demonstrated that the level of school satisfaction decreases among high school students (Elmore & Huebner, 2010; Uusitalo-Malmivaara, 2014), and students with low school satisfaction are more likely to drop out (U.S. Department of Education, 1999). Students with disabilities are less likely to complete Year 12 than peers without disabilities (Australian Institute of Health and Welfare, 2017; Shifrer et al., 2013; Wexler & Pyle, 2012). Therefore, positive school satisfaction can be considered a protective factor that enables students to successfully finish their education.

Results of Strand 1 of this study demonstrated that for the combined groups of students, Mathematics Achievement was related to School Satisfaction, while no relationship was found between English Achievement and School Satisfaction. However, when analysed independently for the groups of students with and without disabilities, the findings showed that Mathematics and English Achievement were uncorrelated with School Satisfaction for students without disabilities. For the group of students with disabilities, Mathematics Achievement and School Satisfaction were correlated positively, but not English Achievement and School Satisfaction. The effect was therefore influenced by the mathematics achievement among the students with disabilities.

Few studies have addressed academic achievement in relation to school satisfaction in the middle years, and findings have been mixed. Previous research indicates that high grades are not necessarily related to more positive school experiences (Epstein & McPartland, 1976; Whitley et al., 2012). Epstein and McPartland (1976) suggested that school satisfaction might be related to how students *feel* about grades they have achieved rather than *good* grades they have received. In other words, those students who feel positive about their academic achievement are more likely to be satisfied or highly satisfied with school. However, in other international studies, school satisfaction was found to be related to academic achievement (Huebner & Gilman, 2006; Hui & Sun, 2010; Suldo et al., 2008; Simões et al., 2010; Tian et al. 2016), but this relationship has not been examined in specific subject areas, a gap addressed in this study. The academic achievement of students with disabilities is affected by their disabilities, and therefore they may need to apply more effort to demonstrate their knowledge. As noted, they may be more likely to be successful, or perceive themselves as successful, in Mathematics than English. Although the findings of this study showed that not all students with disabilities are low achievers, with some achieving at high levels, having successful learning experiences improves their perceptions about their academic abilities and school experiences (Bandura, 2001).

Overall, the investigation of academic achievement in relation to academic wellbeing, as conceptualised in this study, was a replication of prior studies (Huebner et al., 2001; Möller et al., 2009; Shogren, et al., 2010) to obtain insight into this relationship for students with and without disabilities in the Australian context. Consistent with most international studies, Australian students' academic achievement was related to domain-specific self-concepts, academic responsibility for success and school satisfaction. Generally, these Australian secondary students in inclusive education schooling demonstrated a positive level of academic wellbeing.

Research Question 2: **Are there differences in academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) between secondary students with and without disabilities?**

Research question 1 explored relationships between the key variables in this study for students with and without disabilities. To address Research Question 2, differences in outcomes between students with and without disabilities were explored using inferential statistics. Overall, the findings of the quantitative strand of the study mirrored previous Australian and international research findings on differences between the academic achievement and academic wellbeing of students with and without disabilities.

Mathematics and English achievement in students with and without disabilities: The findings of this study showed that the average Mathematics and English Achievement of students without disabilities was statistically significantly higher than the achievement of students with disabilities. Results for students without disabilities were at or above the average expected level of achievement in the Australian Curriculum. However, Mathematics and English Achievement of the students with disabilities were also on average at the expected level in the Australian Curriculum with a spread of students achieving at lower, and higher, levels.

Academic self-concept in students with and without disabilities: Students with disabilities in this study did have lower achievement than the students without disabilities. The average levels of Mathematics, English, and General School Self-concept for students with disabilities were statistically significantly lower than students without disabilities, but with scores that were generally within the average range. Students without disabilities were on average more positive in these self-concepts.

Social comparisons may be a reason for the difference in the level of academic self-concept for students with and without disabilities. Students tend to compare their own achievement with the achievement of other students in the same class (Trautwein & Möller, 2016). As a result, students with a low to an average level of achievement are more likely to develop a relatively low academic self-concept when they are placed in average to high-achieving classes. As mentioned previously, students with disabilities in this study had lower achievement on average than the students without disabilities. According to the big-fish-little-pond effect model (Marsh, 1984), as described in Chapter 2, comparing their level of academic achievement to those of students without disabilities usually results in forming a lower academic self-concept for students with disabilities. Therefore, they become a small fish in a big pond.

Most previous research studies have focused on comparing general academic self-concept between students with and without disabilities, while self-concept is a multi-dimensional construct (Marsh & Scalas, 2010). Relatively little is known about the domain-specific academic self-concept of students with disabilities, with mixed findings in previous research. Some studies have not found any differences in academic self-concept of students with and without disabilities (McCauley et al., 2018). Other empirical and meta-analytic studies (Chapman, 1988; Polychroni et al., 2006; Zeleke, 2004) have shown that students with disabilities perceived themselves as less proficient at reading and mathematics than students without disabilities. This study's findings are consistent with a well-known meta-analysis study by Chapman (1988) that found the self-concept of students with learning disabilities in inclusive schools was lower than that of students without disabilities, but, similar to the findings of this study, their scores were placed in the normal range. Chapman using the Piers-Harris scale that provides a total score for overall self-concept. In this study, a different, but well-validated scale, the Self Description Questionnaire II (Marsh, 1992), was used to examine specific domains of academic self-concepts, Mathematics and English, as well as General School Self-concept, providing evidence on the relative self-concepts for students with and without disabilities in these specific areas.

Academic responsibility for students with and without disabilities: The findings of this study showed that students with disabilities were less likely to attribute their academic success and failures to internal factors than the students without disabilities, although these differences had lower statistical significance than the results for achievement and academic self-concepts. These findings are consistent with the findings of Tabassam and Grainger's (2002) study in Australia that concluded students with learning disabilities (LD) and students with LD/ADHD were less likely to attribute their academic success and failure to themselves than students without disabilities.

As reported in Chapter 4, a positive correlation was found between the domain-specific self-concept scores and Internal Responsibility for Success for students with disabilities only. Prior studies have shown that there is a reciprocal relationship between self-concept and self-attributions (Craven, 1996; Craven, et al., 1991). This means that a change in attributions would be linked to changes in academic self-concept, which in turn improves academic achievement (Toland & Boyle, 2008). Attribution retraining has been an effective intervention to enhance academic achievement and academic self-concept by fostering adaptive attributional beliefs (Hattie, 1992). As a general guideline in this program, students are exposed to experiences of success and failure. Students are then encouraged, through direct feedback or modelling, to match success and failure experiences with adaptive attributions, for example, pairing success with high capabilities and skills and failure with lack of effort and persistency (Chodkiewicz & Boyle, 2014). Such interventions may be effective for students with disabilities to help them improve their beliefs about the causes of success and failure and their attitudes to their academic potential.

School Satisfaction of students with and without disabilities: This study's results did not show any statistically significant difference in School Satisfaction between students with and without disabilities, with average outcomes for both at a positive level, and similar range from lower to high satisfaction. As noted in Chapter 2, previous research about school satisfaction of students with and without disabilities is mixed. The findings of this study concur with studies that found no disability-related differences in School Satisfaction (Gilman et al., 2004; Ginieri-Coccossis et al., 2013; McCullough & Huebner, 2003).

Perhaps in contrast to expectations, some studies have reported higher school satisfaction for students with disabilities than students without disabilities (e.g., Awasthi et al., 2016; Brantley et al., 2002). Awasthi et al. (2016) considered two main factors contributed to positive school satisfaction for students with disabilities in inclusive schools: (a) successful adaptation to an educational environment and (b) access to equal educational opportunities. These two factors may enable students with disabilities to handle academic challenges and be more satisfied with school. However, there have also been findings of lower school satisfaction for students with disabilities in comparison with students without disabilities (Arciuli & Emerson, 2020; Arciuli et al., 2019; Coudronnière et al., 2018; Gallagher et al., 2020; Polychroni et al., 2006; McCoy & Banks, 2012). In a UK study conducted by Arciuli and Emerson (2020), the findings showed that students without disabilities aged 14 years, had higher school satisfaction than students with disabilities. Arciuli and Emerson also found an interaction between disability and gender so that girls with disabilities expressed the lowest level of school satisfaction.

Overall, the lack of difference in the level of school satisfaction between students with and without disabilities in this study may reflect the inclusive education environment of the schools in which the students studied, and more specifically, the educational opportunities that have been provided for students with disabilities to address the impact of their disabilities. Educational opportunities mainly include instructional and assessment adjustments provided for students with disabilities to show their academic potential on the same basis as students without disabilities, discussed further in Research Question 6.

Research Question 3: **Are there differences in academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) across the NCCD levels of implemented adjustments for secondary students with disabilities?**

As reported in Chapter 2, the Nationally Consistent Collection of Data (NCCD) is a relatively new data source in Australia that provides some insights into the extent of support being offered to students with disabilities, even though it does not specify where such support may occur (teaching or assessment) or the nature of the support (Education Services Australia, 2020b).

While numerous research studies have examined the effects of a specific type of adjustment on academic achievement for students with disabilities, there appears to be no published evidence concerning relationships between academic self-concept, academic responsibility, school satisfaction and the levels of learning supports that are provided to students with disabilities in inclusive educational settings. Using analysis of variance, the findings of this study (Table 4.7) showed that there was no difference in academic achievement for students with disabilities across the NCCD levels of adjustments (quality differentiated teaching practices (QDTP), supplementary, substantial). Similarly, no difference was found in Mathematics, English and General School Self-concepts, Internal Responsibility for Success and Failure, and School Satisfaction across the different levels of adjustments for these students.

Very few studies have examined the level of adjustments that students with disabilities have received and their academic achievement and academic wellbeing. Remine et al. (2009) did not find any difference in the general self-concept of Deaf students who received different levels of support in Australia. Remine et al. (2009) reported that deaf students who received more support from teachers of the Deaf in the classroom might have felt more dependent upon their teacher support and therefore less confident. In contrast to the finding of the current study, Gallagher et al. (2020) found that the academic self-concept of students with learning disabilities who received more support (such as speech and communication needs, and physical and sensory disabilities) was lower than for the rest of the participating students.

On the basis of such research, it might be expected, in the present study, that students with disabilities who received a substantial level of adjustments would have lower academic achievement and academic wellbeing compared with students who required the lower level of adjustments. However, this is a new area of research using NCCD data being provided by schools who are still 'finetuning' the processes. The number of students in this study receiving a substantial level of support was also limited. This is an area, therefore, where further research is warranted in the future as more, and increasingly reliable, data become available.

Overall, the quantitative findings of Strand 1 of this study indicated that all Australian students with disabilities are not low achievers. The perception of students with disabilities about academic capabilities and their appraisal of school experiences, especially in mathematics, are related to their achievement level. Although the academic self-concept of students with disabilities was considerably lower than that of students without disabilities, they do not necessarily perceive their abilities negatively. The attitude of students with disabilities to the causes of academic success and failure is similar to that of students without disabilities, that is, they take more internal responsibility for academic success than failure.

Similar to students without disabilities, Australian students with disabilities in mainstream educational settings are generally satisfied with school. The academic achievement and academic wellbeing of students with disabilities are not different based on the NCCD levels of adjustment support that they received.

Research Question 4: **How does academic achievement relate to selected adjustments to classroom assessment for secondary students with disabilities?**

In Strand 2 of the study, qualitative case studies, reported in Chapter 5, the perceptions of four students with disabilities — Alfie, Liam, Daniel and Leo —, their parents and teachers were explored individually as to how the classroom assessment adjustments related to achievement outcomes in focus subject areas. This relationship is discussed separately for each case study student.

In each case study, the nature and impact of the student's disabilities is discussed in the context of the assessment adjustments that were provided, the perceptions of the teacher, student and parent to the adjustments, and the perceived impact of the adjustments on their achievement. As the discussion shows, for three of these students the adjustments enabled enhanced demonstration of their knowledge through the provision of adjustments that addressed their access skills. For one student, Daniel, the provided adjustments were to some extent effective, but further adjustments to the task may have been needed, discussed further below.

In the case of *Alfie*, the student had dysgraphia, a neurological disorder that resulted in functional impairments in his access skills (e.g., difficulties with handwriting, typing, and spelling) for doing the Mathematics task. In this case, the adjustments provided were both inappropriate and appropriate which affected Alfie's Mathematics achievement. Alfie undertook the same Mathematics assessment as other students without disabilities. To address his functional impairment, he was allocated a scribe, with extra time and a separate room to facilitate the use of a scribe. In Term 1, Alfie had the lowest Mathematics Achievement in his class when a scribe untrained in the subject matter content wrote his responses.

The scribe's lack of familiarity with mathematics terminology caused what Alfie dictated to be time-consuming, written incorrectly or out of context. His teacher did not consider his grade reflected the level of mathematical knowledge Alfie was able to demonstrate in class. When an appropriately experienced scribe was available, Alfie's Mathematics Achievement improved considerably. The findings for this case study show that while in principle an adjustment, such as the use of a scribe, may address the effects of a disability, implementation of the adjustment needs to be monitored for quality. The use of a scribe has been reported as the most commonly used adjustment in Australia's external standardised testing, NAPLAN, comprising more than one-third of the adjustments provided for Year 9 students with disabilities (Davies, 2012). The suitability of a scribe, as an appropriate choice of an adjustment~~s~~, is therefore an important issue in adjustments for students with disabilities. For Alfie, allocation of a scribe with appropriate experience led to a differential boost in his achievement (Sireci et al., 2005).

The school determined the provision of a scribe as the appropriate assessment adjustment for Alfie. Use of a laptop in assessment, a device he used during instruction in the classroom for note-taking, could have been a suitable option for Alfie's assessment. However, spelling errors, even when typed, a related lack of coherence in Alfie's sentences, as well as his physical disabilities (e.g., poor fine motor skills), were probably reasons that made the use of the laptop inefficient for Alfie compared with a scribe, within the Mathematics assessment context. Thus, the teacher appeared to make an appropriate judgement about the most effective adjustment for Alfie that enabled him to demonstrate his proficiency in mathematics. The findings for this case study indicated that Alfie's school was committed to the Queensland inclusive education policy by identifying and reducing access barriers to the student's learning and assessment, enabling him to demonstrate a higher level of achievement when the appropriate support was available.

Liam was identified by his school as a twice-exceptional student (giftedness and Autism Spectrum Disorder). Liam's disabilities led to functional impairments in access skills to undertake the Mathematics task (e.g., handwriting skills). Overall, several modes of adjustments were provided for Liam during his mathematics examination. He was allowed to answer parts of the task verbally to the teacher, to handwrite some responses, and to type responses to the remaining questions. To enable Liam to show his high-level abilities in Mathematics, he was provided with an extension task which he modelled using Excel. From the student's perspective, using computer technology and software (e.g., Excel) to calculate more complex problems were appropriate adjustments. Removing the effects relating to impairments in access skills reflects the suitability of the adjustments.

One of the key points in this case study was the inclusion of Liam in the decision-making process for making adjustments. This reflects the teacher's and parent's valuing of the student's role in selecting suitable adjustments based on learning abilities and needs. The student-teacher discussions enabled Liam's teacher to better understand Liam's high potential and to create a more cognitively demanding task. On the other hand, consultation with the student enhanced the teacher's awareness of impairment in Liam's access skills, and therefore he could provide the required adjustments.

Overall, in this case, modes of assessment were varied to allow oral presentation and discussion, some handwriting, and use of a computer for additional simulation and presentation. In comparison to the more limited adjustment provided to Alfie of a scribe to record responses, this selection of a range of adjustments, in collaboration with Liam, may reflect the considerable experience of the teacher and, potentially, greater flexibility in the provision of adjustments within the school. Liam perceived that the provided adjustments were beneficial, enabling him to demonstrate his full potential well.

Daniel was a student identified as having multiple disabilities (learning difficulties, autism spectrum disorder, attention deficit hyperactivity disorder, and speech and language impairment). Given the considerable effects of the disabilities on his learning, Daniel was provided with a substantial level of classroom adjustments for both access skills (e.g., teacher aide and use of a computer) and target skills (e.g., lower academic level of work, modified grading rubric, reduced workload). Although Daniel was reported by the teacher to complete the level of work he was given satisfactorily, Level 4, he was academically behind his same-age peers in the inclusive classroom. Neither student nor teacher was satisfied totally with the obtained achievement. As noted previously, student perception of achievement outcomes is more related to school satisfaction than their grades (Epstein and McPartland, 1976).

Daniel's low satisfaction with his achievement results from a mismatch between the target skills of English assessment and the student's age-related level of achievement. Daniel's teacher tried to make suitable adjustments for Daniel's English task but considered the target skills of the adjusted task were not sufficient to match Daniel's cognitive abilities. Many students with autism spectrum disorder require high levels of adjustments to participate in and undertake their classroom activities (Pellicano et al., 2014). However, generally speaking, teachers do not have sufficient specialised knowledge and training to meet the learning needs of these students (Saggers et al., 2016; Soto-Chodiman et al., 2012). Identifying the nature of disabilities and their effects on student learning and assessment is often difficult for general teachers (Morton, 2007). Teachers cannot provide appropriate adjustments without sufficient understanding about the level of student *actual* capabilities and the level of *potential* development that they can reach (see Vygotsky, 1978). Thus, in Daniel's case, identifying the student's actual target skills can be a starting point to set realistic expectations and provision of suitable adjustments to enable him to achieve successful learning experiences.

In the case of *Leo*, the student was identified as having learning disabilities (e.g., spelling difficulties, reading comprehension), speech and language impairment, and an auditory processing disorder. Leo’s work samples in both English and history assessments informed this study. The English task was not assessed differently from other students and was completed under a standard time condition. Leo was supported to stay on his task, and the teacher corrected Leo’s spelling and grammatical errors to some extent. Supports provided by Leo’s teacher resulted in a grade gain, especially in the domain of literacy, where Leo had considerable difficulties.

Furthermore, the available evidence showed that Leo frequently noted that he was slow at doing his work and required extra time for the English task completion, which was available. Generally, extra time could be an appropriate adjustment for students with low processing speed if the assessment is not a speed test and the processing speed is not intended to be measured by the assessment (Davies et al., 2018; Kettler, 2012). In this case, access to additional time represents an access skill that could be an appropriate adjustment for Leo if required.

A writing template with starter sentences was used to increase accessibility of the History task for Leo. Although ‘sentence starters’ are commonly used as scaffolds in differentiated instruction to assist students with disabilities (de Bruin, 2018), such scaffolds are not allowed as reasonable adjustments in Australia’s standardised testing, NAPLAN (ACARA, 2016). To date, only limited attention has been given to the role of sentence starters in supporting students with disabilities. Preliminary analysis of the validity of adjustments to the History task provided for Leo indicated that the overall target skills were not changed (Sireci, 2008). The findings showed that using starter sentences considerably reduced the impact resulting from impairments in Leo’s access skills. Despite the presence of considerable misspellings in Leo’s responses, the teacher’s focus was on assessing the student's historical knowledge and skills. Under the provided adjustment, Leo was able to engage actively in the task and demonstrate these. In this case study, the access skills required for the History assessment were target skills that were planned to be assessed in the English assessment task. Thus, different assessment adjustments were needed for the two subject areas—the provision of adjustments depends on assessment criteria and student access skills impairment.

Overall, findings for each case study student showed that identification of functional impairments in student access skills can result in provision of suitable adjustments through which students are able to participate in and undertake their assessment on the same basis as students without disabilities. The Mathematics and English grades of the case study students improved when they received suitable adjustments to classroom assessment. In three cases, findings reflect that students with disabilities are not low achievers and can obtain average to high levels of achievement in some or even all subject areas. For Daniel, who required adjustments to both target and access skills, positive achievement did occur. However, the teacher and student were not satisfied with the outcome, for different reasons. These reasons, for Daniel, relate to the issues of academic wellbeing addressed in the next Research Question.

Research Question 5: **How does academic achievement under adjusted conditions relate to academic wellbeing (academic self-concept, academic responsibility, school satisfaction) of secondary students with disabilities?**

Research Question 5 explored relationships between academic achievement and the provided adjustments to classroom assessment for four case study students individually. In

Research Question 6, these students' academic achievement in relation to their academic wellbeing was investigated (Chapter 6). Overall, the qualitative strand of the study presents new findings that add to the limited previous research undertaken on academic achievement and academic wellbeing under adjusted conditions.

Academic achievement and academic self-concept: According to the Queensland Curriculum & Assessment Authority (QCAA; 2020), Alfie, Liam, and Leo's achievements in Mathematics and English, assessed under adjusted conditions, were higher than the expected Achievement Standard (grade C) in their Year level. In terms of academic self-concept, findings showed that Liam and Alfie expressed high levels of Mathematics Self-concept. In the subscale of English Self-concept, Leo rated his English competencies at the average level, while Daniel perceived his English capabilities negatively. The study's qualitative findings demonstrated that Mathematics and English Achievement were positively related to the corresponding self-concepts. The extent to which this relationship has been fostered because of the assessment adjustments provided to the case study students is discussed further below.

As previously mentioned, Alfie had a specific learning impairment, dysgraphia. To date, no research study has been found investigating students' academic achievement with dysgraphia in relation to their academic self-concept when they qualify for the support of a scribe as an adjustment, as examined in this study. In Alfie's case, the scribe's background, or lack of background, knowledge in Mathematics was an influential factor in the student's Mathematics Achievement and his positive perception of his mathematical abilities and skills. Further, access to extra time to accommodate the use of a scribe and a separate room enabled the student to perceive that he *can* undertake the same assessment tasks as other students. Findings for Alfie's case align with the social-cognitive framework of this study, indicating that the implemented adjustments (environmental factor) may substantiate the student's perception of his mathematical competency (high Mathematics Self-concept — personal factor), motivating him to engage in productive behaviours such as more effort and persistence (behavioural factors).

The focus on the scribe's experience and knowledge is important because the lack of these may negatively affect student academic achievement and their wellbeing. For example, Alfie's mother stated that Alfie achieved D- in Mathematics when he was allocated an inappropriately experienced scribe, and it was "very disheartening" for Alfie. Although the rules relating to scribing (e.g., experience working as a scribe) have been detailed in the protocol of the NAPLAN test administration in Australia (ACARA, 2021), there are still barriers to identifying and arranging scribes at the school level, discussed further below. Overall, if Alfie had not had the assessment adjustment that was provided in Term 2, his Mathematics Self-concept may have been affected.

In this study, it was reported that Liam was identified as a gifted student with an autism spectrum disorder, a twice-exceptional student. There has been no published research reporting on the academic achievement of twice-exceptional students in relation to academic self-concept under adjusted conditions. Few studies have been conducted on the academic self-concept of twice-exceptional students, findings generally have shown that this group of students have low academic self-concept (Townend & Pendergast, 2015) and demonstrate low academic achievement (Siegle & McCoach, 2002). Low academic self-concept of twice-exceptional students results from the discrepancy between a high level of expectations because of their giftedness and underachievement caused by their disabilities (King, 2005). This study produced a new finding that showed a twice-exceptional student could have high academic achievement coupled with a strong academic self-concept when the impact of their disabilities on assessment was addressed through the provision of suitably ‘tuned’ adjustments.

Liam’s positive perception of his academic abilities may derive from two influences: (a) focus on the student’s *strengths* in mathematics, and (b) access to a variety of adjustments that eliminated barriers relating to his impairments in access skills. In response to Liam’s proficiency in mathematics, the student was provided with an extension task, with which he actively engaged and achieved an above-average grade (A+). According to social-cognitive theory (Bandura, 1982), focus on student academic strengths (personal factor) through providing adjustments (environmental factor) motivates their learning that results in higher academic achievement (behavioural factor) and positive academic self-concept (personal factor). When a student engages more with a task, their academic self-concept is positively impacted by classroom achievement (Wouters et al., 2015). Accordingly, it is critical to match the learning needs of twice-exceptional students to the school curriculum, alongside adjustments for any disabilities, and to provide access to specialised programs that enhance their area of strength, which help foster and maintain positive academic self-concept. Overall, findings for these case study students, Liam and Alfie, indicated that Mathematics Achievement was positively related to Mathematics Self-concept. More importantly, this relationship was boosted by providing suitable adjustments to classroom assessment.

The relationship between English Achievement and English Self-concept was also investigated for two case study students, Daniel and Leo. In Daniel’s case, the student was diagnosed with an autism spectrum disorder. He encountered comorbid conditions such as anxiety, attention difficulties, learning and communication issues. As previously mentioned, to reduce the effects of Daniel's impairments in access skills, he was supported through a teacher aide and the use of a computer. The target skills of the English assessment were also highly adjusted through the reduced assessment workload requirements and the modified question. To determine the level of Daniel's academic achievement, a modified grading rubric was used.

Findings showed that Daniel's low English Achievement was closely related to his low English Self-concept. Further, the provided adjustments did not help improve Daniel's perception of his English abilities. The main reason may be that the adjustments (e.g., reduced workload) provided for Daniel did not quite match the *actual* level of his academic abilities. Daniel stated that he still struggled to achieve good results although he undertook an adjusted assessment compared with his classmates. This highlights that although the provided adjustments were to some extent effective, he failed to experience, or to consider that he had experienced, success because he did not perceive that he had achieved.

According to Bandura (2012), a fundamental strategy for forming a positive academic self-concept is by mastering the related task (Marsh & Martin, 2011; Möller et al., 2020). This suggests that the most effective approach to improving student perception of their academic abilities is through *repeated* success in the same or similar tasks. This happens if the level of the assessment can be tailored to be realistically attainable by the student. Therefore, having successful academic experiences appears to be a better starting point for enhancing Daniel's academic self-concept, which in turn may reduce his feeling of anxiety. Academic self-concept has been identified as a strong predictor of performance-related emotions such as anxiety (Raufelder & Ringeisen, 2016). Individuals who feel less anxious in a situation may perceive that they can succeed, while an anxious person may feel less competent (Bandura, 2012; Schunk & DiBenedetto, 2020).

As previously mentioned, Leo had speech language impairments and experienced co-occurring difficulties with spelling, reading comprehension, information processing speed, and a starting point to write texts. Spelling difficulties are typically affected by language impairments (Williams et al., 2013) that often cause a student to perform more poorly in spelling than students without disabilities (Joye et al., 2019). Given the elements of the target skills that were intended to be assessed, Leo's English assessment task was not adjusted except for a small amount of support (e.g., correcting some spelling and grammar errors). In Leo's case, his English Achievement of an average level was closely related to his average level of English Self-concept. Although there has been limited research to investigate the self-concept of students with speech language impairments, the research evidence shows that these students often have poor general self-concept (Durkin et al., 2017; Lindsay & Dockrell, 2012). However, the multidimensional nature of academic self-concept has not been investigated in these studies. Previous research has also indicated that students' language difficulties strongly affect their self-belief through shyness (Wadman et al., 2008). Although Leo was not described as 'shy' by any participants, he was emotionally affected due to his spelling difficulties; consequently, he reported he felt embarrassed to ask his teacher for support.

Academic achievement and academic responsibility: The findings of this study indicated that Alfie, Liam, and Leo had a strong internally-oriented responsibility for academic success. These students' high academic achievement was related to their high Internal Responsibility for Success. The influential role of adjustments cannot be ignored in the students' positive attitudes to their individual potential and capabilities. These students could not successfully demonstrate their knowledge and skills in their assessment tasks if they were not provided with the required adjustments. Consequently, each adjustment is an opportunity for a student with disabilities to show what they know. All case study students had more than one assessment adjustment which enabled them to be capable of completing their tasks. In three case studies, they were motivated to engage cognitively when undertaking the assessment and show their learning in the way that they felt best represented their knowledge. In the case of Liam, the student was more self-regulating and persisted more on difficult academic tasks.

In Daniel's case, his *low English Achievement relative to peers was related to a low Internal Responsibility for Success*. The student's orientation to attributing academic success to outside factors coupled with low academic achievement and negative attitudes toward academic abilities can result in a negative cycle of defeat where he may no longer persist in doing academic tasks (Bandura et al., 2003). Students like Daniel are at more risk of developing a sense of learned helplessness with continual unsuccessful experiences (Shogren et al., 2010). Additionally, they tend to experience more anxiety because they are more likely to focus on barriers than opportunities (Rotter, 1966). Further, Daniel was more likely to take internal responsibility for failure, while the other case study students were not. However, this is an area that warrants more research in inclusive education. Overall, research evidence shows that locus of control is a malleable factor (Wang & Su, 2013). This means that teachers could implement practices (e.g., providing timely and constructive feedback; Thayer et al., 2018) that are intended to enhance student internal academic responsibility, which in turn may improve academic achievement.

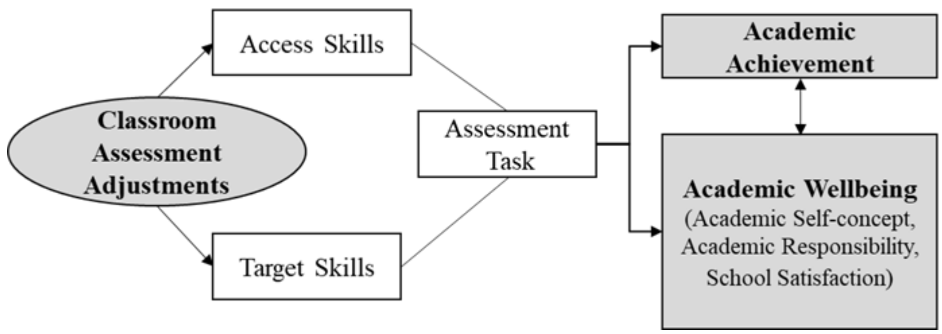
Academic achievement and school satisfaction: Findings of the current study indicated that three case study students, Alfie, Liam, and Leo, rated themselves satisfied with school. A positive relationship was observed between higher achievement in Mathematics and English and positive School Satisfaction. The students' positive perceptions of the provided adjustments enhanced the relationship between academic achievement and school satisfaction. According to social-cognitive theory, school satisfaction is an individual's cognitive assessment of the quality of their school experience (personal) (Huebner, 1994). Students with disabilities who are satisfied with school are more likely to engage in classroom activities (behavioural) on the same basis as their peers because of adjustments (environmental) that enabled them to demonstrate their abilities.

The reverse is also true. In the case of Daniel, the student rated himself dissatisfied with school. Daniel's low English Achievement was related to the low level of his School Satisfaction. This relationship may be affected by four main factors. The first factor is the impact of Daniel's disabilities (learning difficulties, autism spectrum disorder, attention deficit hyperactivity disorder, speech and language impairment) on his attitude to school and academic achievement. Studies continue to show that the nature and severity of student disabilities contribute to their appraisal of abilities and school experiences (Gallagher et al., 2020; Uppal, 2006). In an Irish study, McCoy and Banks (2012) found that nine-year-old students with multiple disabilities were more likely to dislike school than students with a specific type of disability (e.g., physical, visual, speech impairment). Second, there was a large discrepancy between the level of Daniel's academic achievement and his classmates' achievements. For example, Daniel's mother reported that Daniel's reading, writing, and mathematics achievement were "considerably" lower than those of his classmates in the same year level. This big gap in the level of academic abilities may result in Daniel's negative appraisal of school. Third, Daniel stated that he got easily bored (behavioural) in the classroom, which may relate to complex educational content (environmental) taught in the classroom that does not match the level of Daniel's academic abilities (personal). Students who are interested in learning are more likely to have positive psychological wellbeing than those who are bored in class (Csikszentmihalyi & Hunter, 2003). Fourth, despite the provided adjustments, Daniel did not perceive his academic experiences as successful and perceived his academic abilities negatively. Nevertheless, as mentioned previously, fostering a positive perception of abilities by providing more successful learning opportunities and enhancing the learning potentials can lead to a change in the student's attitude to school.

Overall, the Mathematics and English Achievement of the four case study students with disabilities were closely related to their Mathematics and English Self-concept, respectively. The case study students with higher Mathematics and English Achievement took more Internal Responsibility for Success and were more satisfied with school. Further, the findings of this study evidenced that low achievement in English was highly related to low English Self-concept, low Internal Responsibility for Success, and low School Satisfaction. The study's qualitative findings highlight the effects of the tailored adjustments on these students' academic achievement in relation to their academic wellbeing. The four case study students were examples of groups of students with disabilities whose academic achievement and wellbeing have been rarely investigated in studies. The findings of this study emphasise that when suitable adjustments are made in line with student learning needs, students with disabilities are able to demonstrate their abilities on the same basis as students without disabilities. Figure 7.1 shows how the provision of classroom assessment adjustments is related to student achievement and their wellbeing.

Figure 7. 1

The Interplay of Access and Target Skills, Classroom Assessment Adjustments, Academic Achievement and Academic wellbeing



7.2. Findings and Discussion of the Mixed Method Study

This study addressed the relationship between academic achievement and academic wellbeing for Australian secondary students with and without disabilities. Further, the academic achievement of secondary students with disabilities and their academic wellbeing were explored in relation to provided classroom assessment adjustments. As noted in Chapter 3, a mixed method approach was used in this study to respond to related aspects of the research questions (Teddlie & Tashakkori, 2009). The study incorporated two strands: a quantitative study with a larger population of Australian students with and without disabilities in mainstream inclusive education settings; and, a qualitative strand using a case study approach to explore achievement, wellbeing and adjustments for four students.

This section of Chapter 7 presents the synthesis and integration of the findings from both strands of the mixed method study. The term 'integration' in mixed method studies does not necessarily mean reaching a single understanding based on the research results. Integration means making meaningful conclusions on the basis of findings obtained from both quantitative and qualitative strands of the study (Tashakkori & Newman, 2010). The findings of this study are no exception to this rule. The following discussion synthesises findings across the five research questions, examining the relationship between academic achievement, academic wellbeing and assessment adjustments for the case study students in light of the overall quantitative findings of the relationship between academic achievement and wellbeing.

The study demonstrated that there is a relationship between academic achievement and students' self-concepts in relationship to their learning. The findings from both strands of the study provide potentially conflicting but informative findings about this relationship. The quantitative findings of this study indicated that participating students with disabilities on average did have significantly lower achievement than the students without disabilities. However, the results also showed that there was a range of achievement for both groups of students. Students with disabilities were not necessarily low achievers. As for the students without disabilities, a proportion of students with disabilities had higher achievement. This finding is evidenced through the case study students' academic achievement. Mathematics and English grades of three students, Alfie, Liam and Leo, were higher than the expected Australian achievement standard in their Year level, which reflects that students with disabilities in inclusive education in mainstream Australian schools are not necessarily low achievers and can reach a high level of achievement in some or even all subject areas. Increasing the achievement of students with disabilities through appropriate differentiation in inclusive education is a core Queensland government policy (Department of Education (Queensland), 2018).

In the quantitative strand of the study, the findings demonstrated that Mathematics Achievement was positively related to Mathematics Self-concept for students with and without disabilities. This reflected findings from other Australian and international research. Findings for the case study students were similar, Mathematics Achievement and Mathematics Self-concept were linked positively. Approximately 50% of students without disabilities and 5% of students with disabilities achieved an A, the highest grade, in Mathematics. Just over 50% of students without disabilities and nearly 25% of students with disabilities had a high Mathematics Self-concept. Therefore, the case study students, Alfie and Liam, were among the few students with disabilities who are both high achievers and have a high level of Mathematics Self-concept. The research evidence based on the experiences of these case study students supported the effective role of the provided adjustments in terms of both their Mathematics Achievement and the relationship between Mathematics Achievement and Mathematics Self-concept.

Strand 1 findings indicated that English Achievement and English Self-concept were positively related for students without disabilities but this connection was not found for students with disabilities. However, the relationship was found for the case study students with disabilities—their English Achievement was directly related to their English Self-concept. The English Achievement of the case study students was mixed, ranging from four years below Year level for Daniel, a C for Alfie, a B- for Leo, and an A for Liam (Table 6.1). As the case study students' English Achievement reduced, their English Self-concept reduced. Daniel had a negative English self-concept. Alfie and Leo had 'average' English Self-concept.

Liam had a positive English Self-concept. This finding reflects Susperreguy et al.'s (2018) findings that showed reading self-concept was related to reading achievement across different levels of achievement. Overall, with the provided assessment adjustments, the case study students were able to achieve in their English tasks. Although the provided adjustments were, to some extent, beneficial for Daniel's English Achievement, his perception of his English abilities was still negative due to his perceived lack of successful academic experience.

Study findings reflected previous research findings on the big-fish-little-pond-effect (BFLPE) model. The synthesised findings of this study emphasise that students with disabilities are not necessarily low achievers within inclusive classrooms and can reach a high level of achievement in some or even all subject areas similar to students without disabilities. The Mathematics and English Self-concept of the majority of students with disabilities were in the average range. This finding reflects that the education of students with disabilities alongside students without disabilities does not necessarily cause them to perceive their academic abilities more negatively. However, a student with disabilities whose academic achievement is considerably lower than most peers is more likely to form a negative perception of their academic capabilities. Two different examples are presented below to show the academic achievement of students with disabilities in relation to their academic self-concept within inclusive classrooms.

Liam and Daniel were identified by stakeholders as high achieving and low achieving students with disabilities within inclusive classrooms, respectively. Liam had the highest level of Mathematics Self-concept among participants, while Daniel expressed the lowest English Self-concept level. According to the BFLPE model, students compare their own academic abilities with those of their classmates and use social comparisons in forming their own academic self-concept (Möller et al., 2009). In this model, Liam is viewed as a big fish (achieving highly) in a small pond (taking into account the whole cohort). Compared with other students, the student's high academic achievement results in more positive beliefs about academic abilities, especially in mathematics. By contrast, Daniel is considered a small fish in a big pond, and therefore a negative BFLPE may occur. Daniel perceived his academic capabilities as lower than students with average and high abilities and has developed a negative academic self-concept. Although Daniel completed adjusted tasks at a satisfactory level, he perceived himself as 'hopeless in English classes'. He was aware that his achievement was much lower than his peers' achievements. Daniel's mother voiced that Daniel's reading, writing, and mathematics achievement was 'considerably' lower than his classmates.

Most studies conducted on the BFLPE have emphasised the 'dark side' of the BFLPE, that is, what occurs to student academic self-concept in a classroom with students with higher abilities. The above two examples demonstrate that the BFLPE is a double-edged sword. This means that although social comparison may affect student academic self-concept negatively in a classroom with students with higher abilities, a student with high achievement benefits from being in a mixed-abilities classroom. Given that the BFLPE is an age-based process and stronger for high school students than primary school students (Fang et al., 2018), maintaining and fostering academic self-concept is of significance, especially for students with disabilities.

This study supports the notion that the provision of appropriate adjustments may enhance the academic self-concept of students with disabilities by improving their participation to demonstrate what they know on the same basis as students without disabilities.

The extent to which students take academic responsibility for their learning outcomes is an interesting finding. Strand 1 of the study showed that Mathematics Achievement was weakly related to Internal Responsibility for Success but not for Failure among all students. No relationship was found between Mathematics or English Achievement and Internal Responsibility for Success and Failure for the smaller sample sizes of the individual groups, that is, students with and without disabilities. A relationship was found for students without disabilities between Internal Responsibility for Success and Failure, that is, there was a reciprocal relationship. However, there was not a significant relationship between these two aspects of Internal Responsibility for the students with disabilities. Overall, students without disabilities were more likely to take responsibility for their success and failure than the students with disabilities (see Table 4.6), but students with disabilities had a wide range of responses to both aspects of Academic Responsibility, especially for Internal Responsibility for Failure.

In the qualitative strand of this study, a connection was found between achievement in Mathematics and English and Internal Responsibility for Success. The three case study students with moderate to high achievement, took more responsibility for their success. Low academic achievement was related to low Internal Responsibility for Success for one case study student, Daniel. Their responses for taking responsibility for failure were varied, reflecting the quantitative findings for Strand 1. Given the low reliability for Internal Responsibility for Success in this study, generalising the findings of this subscale is not recommended. This issue is one of the study limitations that is discussed further in Chapter 8.

Students in Australian inclusive education settings are predominantly satisfied with school. The findings from the quantitative strand, Strand 1, indicated that Mathematics Achievement was positively related to School Satisfaction for students with disabilities only. Similarly, the case study students with higher Mathematics Achievement showed more positive School Satisfaction. In English, in the quantitative strand, academic achievement was unrelated to School Satisfaction for either group, students with or without disabilities. However, in the qualitative study, the English Achievement of the case study students, Daniel and Leo, was related to the level of their School Satisfaction. Daniel's negative perception of his academic abilities and low English Achievement are considered key factors in his negative appraisal of school in this study. Overall, however, the qualitative and quantitative findings reflect Australian students with and without disabilities, on average, are more likely to be satisfied with school. The School Satisfaction of students with disabilities can be related to more educational opportunities that are provided for them to participate in and undertake classroom activities in mainstream schools.

Findings from Strand 1 of the study showed that there was no difference in academic achievement and academic wellbeing across the NCCD levels of adjustments (quality differentiated teaching practices [QDTP], supplementary, substantial). For approximately 34.5% of participating students with disabilities, support, based on the NCCD classifications, was provided within QDTP. In the qualitative strand, while three case study students fell within support provided within QDTP[13], Daniel could be regarded as having supplementary

[13] . Although ethical approval allowed provision of the information, the schools declined to provide the NCCD classifications for the focus students except for Alfie who was identified as receiving QDTP support.

and potentially substantial adjustments. At the substantial level, students with disabilities require frequent supports at most times to undertake their educational activities. Typically, students require modified curriculum which is different from that of the same-age classmates. Student's tasks are significantly modified, and frequent individual instructions might be required. Students who require supplementary adjustments are provided with tailored programs in some learning areas at specific times (e.g., explicit instruction, extra time). NCCD advice re substantial includes "adapted assessment procedures (e.g., assessment tasks that significantly adjust content and/or the outcomes being assessed)" (Education Services Australia, 2020a).

This study used a **social-cognitive lens** to indicate how student learning is the result of reciprocal interactions between the main three factors: personal (e.g., academic self-concept, social comparisons), behavioural (e.g., academic achievement) and environmental factors (e.g., educational adjustments). **The qualitative findings of this study clearly showed the interplay of academic achievement, classroom assessment adjustments, and academic wellbeing for four case study students with disabilities.** Consistent with social-cognitive theory, in the biopsychosocial model of disability, disability results from the interaction of health conditions, psychosocial characteristics and environmental factors. Thus, the learning functioning of students with disabilities is greatly affected by these triadic factors. Effectively responding to the learning challenges that students with disabilities face, and ensuring that education systems consider their wellbeing, enable students with disabilities to fully participate in and undertake classroom assessment 'on the same basis' as peers without disabilities. This study's evidence supports the biopsychosocial model of disability and presents first-hand examples from the key stakeholders' perspectives of how medical problems and environmental and psychosocial factors affect the participation of students with disabilities in classroom activities and assessment.

In the context of health conditions, twice as many students with disabilities in Strand 1 of the study were reported to experience health problems than those of participating students without disabilities (see Table 3.1). Similarly, the evidence from the qualitative study showed that the three case study students, Alfie, Daniel, Leo, had medical problems (e.g., migraine headaches, use of medications) that resulted in multiple absences and missing classroom instruction. This research evidence reflects that the impact of the impairment, as an individual characteristic, should not be underestimated, often ignored in the social model of disability (Shakespeare, 2006). Factors such as discomfort, pain and fatigue or even side effects of some medications that may affect the academic functions of students with disabilities should be considered in inclusive education.

In terms of psychosocial factors, a disability may affect a student's thoughts, emotions, and behaviours. For example, Leo reported that he felt embarrassed to request extra help and tried to hide his spelling difficulties from his classmates, which in turn may convey the message that he does not want to be seen differently in the classroom. Feldman et al. (2011) showed that more than half of the students with disabilities in their study felt embarrassed to receive extra help from a teacher during a test because they were worried about the judgement of other students about their abilities. As a result, the socio-emotional needs of students with disabilities need to be identified and addressed (Baker & Scanlon, 2016; Mather et al., 2009; McMillan, 2014).

In addition to student disabilities, medical conditions, and psychosocial factors, educational barriers (e.g., availability of a scribe, time limitations, teacher knowledge) are other factors that affect student participation in classroom assessment. For example, Alfie's teacher reported that although the presence of a scribe could be beneficial for Alfie, a scribe's *availability* might not always be possible and raised core practical issues for such assistance.

The study demonstrated the value of identification of and adjustments to access and target skills for students with disabilities. As noted previously, when students do not have sufficiently well-developed access skills, their academic outcomes may reflect their limitations in that area, rather than in the target skills that are being measured (Dembitzer & Kettler, 2018). As noted in Chapter 5, the History teacher did not provide any adjustments for Leo in Term 1. With the adjustments provided in Term 2, his grade was considerably improved. Daniel's teacher also stated that she would explore further ways to adjust Daniel's task in terms of both access and target skills to be more suitable to Daniel's cognitive needs. These examples reflect that the skills that the student required to undertake the assessment task may not have been identified appropriately or needed continued review. Published studies have shown that Australian teachers lack adequate specialised knowledge and training to meet the learning needs of students with autism spectrum disorder in mainstream schools (Saggers et al., 2016; Soto-Chodiman et al., 2012). This issue might constrain teachers from making optimal adjustments, which in turn could influence the quality of adjustments offered as well as the student's learning outcomes. To achieve successful inclusive education, teachers need an in-depth understanding of the learning needs of students with disabilities to identify and eliminate barriers in the learning and assessment process (Graham, 2020; Kershner, 2014).

The findings of this study show that consultation with students and their parents about specific learning needs will improve inclusive education provision; successful

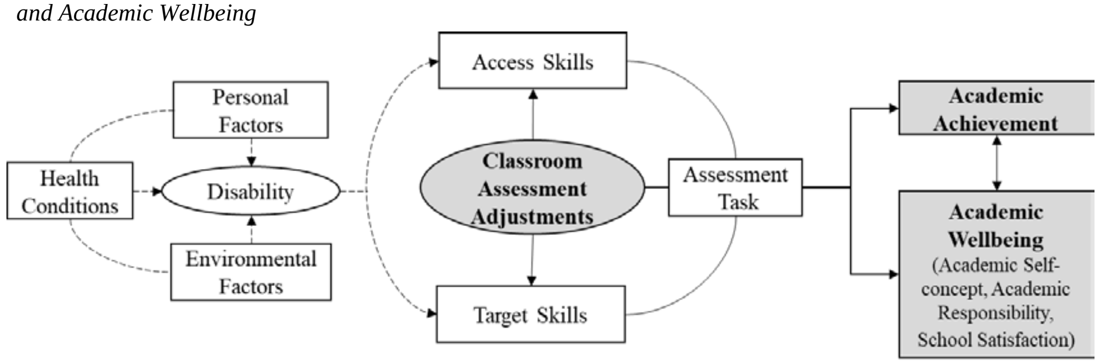
inclusive education relies heavily on parents. In the qualitative strand of the study, reported in Chapter 5, the participating teachers demonstrated commitment to inclusive education policy by identifying and reducing educational barriers to the students' learning and assessment. However, only two of the case study students reported in survey responses that they were consulted in relation to adjustments required for the focus assessment tasks that they completed. As identified in the Disability Standards for Education (DSE, 2005), education providers are obliged to consult with students with disabilities and their parents/carers to determine appropriate adjustments to meet individual student needs in classroom teaching and assessment. The research evidence of this study, as reported in Chapter 5, showed that consultation commonly occurred at the beginning of the school year. However, it is expected that education providers will regularly consult with students to evaluate and modify adjustments based on students' changing needs (DSE, 2005).

In this study, the parents of case study students had valuable knowledge and experience about their children's specific learning needs. This important information should be shared with education staff to make good decisions about adjustments. For three cases, Alfie, Daniel, and Leo, there was clear ongoing communication, but to a differing extent, between the teacher and mother about the curriculum being studied, resources used and assessment adjustments. This evidence strongly emphasises the inclusion of students with disabilities and their parents in the decision-making process on adjustments. This helps teachers in two ways: (a) identifying students' functional impairments in access skills more accurately, and (b) determining appropriate adjustments or modifying them to be more effective. In this study, there was a range of school contexts, including the overall educational and occupational status of parents (ICSEA) and teacher experience. Differences in school context do not appear to have had any systematic impact on the adjustments provided, which may be due to the structured curriculum implementation and assessment development processes of education in Australia.

Overall, this study supports the notion that disability results from three triadic factors: health conditions (e.g., disorders, disease), environmental barriers and psychosocial characteristics. Impairments in access skills resulting from disability limit student participation in undertaking target skills of assessment. As shown in Figure 7.2, a student with disabilities may have impairments in both access and target skills. Classroom assessment adjustments are provided to remove or reduce the effects of impairments. Adjustments to target skills may not only be provided for students with more extensive cognitive disabilities but also to enhance learning challenges for twice-exceptional students to demonstrate their full potential. Appropriate adjustments improve the academic achievement of students with disabilities, which in turn relates to their academic wellbeing. The interplay of disability, access and target skills, classroom assessment adjustments, academic achievement, and academic wellbeing is presented in Figure 7.2.

Figure 7. 2

The Interplay of Disability, Access and Target Skills, Classroom Assessment Adjustments, Academic Achievement, and Academic Wellbeing



Overall, the synthesised findings show that Australian students with disabilities in inclusive education in mainstream schools are not necessarily low achievers and, in some cases, can obtain high levels of academic achievement. Generally, the perception of students with and without disabilities about academic capabilities, especially in mathematics, is related to their achievement level. Both students with and without disabilities have a similar thinking style about academic responsibility, that is, they are more likely to take internal responsibility for academic success than failure. In Australian inclusive education settings, students with and without disabilities are mainly satisfied with school. Specifically, the level of school satisfaction of students with disabilities is related to their academic achievement, especially in mathematics. The provision of classroom assessment adjustments bridges the gap between the academic achievement and academic wellbeing of students with and without disabilities, especially in mathematics. In the next section, Chapter 8, the strengths and limitations of this study are described, and recommendations for practice and future research are presented.

CHAPTER 8: Conclusions

8.0. Overview

The overall purpose of this study was to investigate the relationships between academic achievement and academic wellbeing (academic self-concept, academic responsibility, school satisfaction) and the role of assessment adjustments in contributing to achievement and wellbeing for secondary students with disabilities. A mixed methods approach was used to investigate relationships between academic achievement and academic wellbeing. The purpose of the quantitative strand of the study was obtain insight into relationships between academic achievement and academic wellbeing for secondary students with and without disabilities in the Australian context. The following key findings were drawn from this strand of the study, reported in Chapter 4:

- Students with disabilities on average did have significantly lower achievement than the students without disabilities. However, like the students without disabilities, a proportion of students with disabilities showed high achievement.
- Mathematics Achievement was positively related to Mathematics Self-concept for students with and without disabilities. However, English Achievement and English Self-concept were positively related for students without disabilities only. Students without disabilities perceived their mathematical and English abilities more positively than peers with disabilities.
- No relationship was found between Mathematics or English Achievement and Internal Responsibility for Success and Failure for students with and without

disabilities. However, students without disabilities were more likely to take responsibility for their success and failure than the students with disabilities.

- A significant relationship was found between Mathematics Achievement and School Satisfaction for students with disabilities only. No difference was found between both groups of students in School Satisfaction.

The understanding of students' academic achievement and their academic wellbeing is beneficial specifically when making decisions about educational adjustments. Therefore, the purpose of the qualitative strand of the study was used to examine more closely the relationship between academic achievement, academic wellbeing and the provision of assessment adjustments for four case study students with disabilities. Situated within the findings from the quantitative data, the qualitative data contribute to inclusive education assessment theory and practice on the effects of classroom assessment adjustments on academic achievement of students with disabilities. These effects were explored through the perspectives of students with disabilities, their parents and teachers who provided first-hand experiences of practices to meet the needs of students with disabilities in mainstream, inclusive, classrooms. As reported in Chapter 6, the following key findings were drawn from this strand of the study:

- Mathematics and English Achievement interconnected with classroom assessment adjustments across the four students with disabilities. Three case students with disabilities demonstrated high Mathematics and English Achievement under the adjusted situations. The level of academic achievement for one case student was considerably lower than his same-age peers in this study.

- The positive academic self-concept of the case study students might be related to the adjustments that enabled them to demonstrate their knowledge. For one case student with disabilities, a substantial level of classroom adjustments improved his English Achievement but did not lead to the formation of a positive English Self-concept.
- Mathematics and English Achievement were related to Internal Responsibility for Success for three case study students with disabilities.
- Mathematics and English Achievement under adjusted conditions were associated with positive School Satisfaction for three case study students. Only one case study student had low satisfaction with school despite access to the different types of adjustments.

Including key stakeholders (teachers, students, parents) in this study resulted in more insight regarding the effectiveness of adjustments to classroom assessment on the academic achievement of students with disabilities. The case study findings of this study make a valuable contribution by providing insight into the academic achievement of students with disabilities in relation to their academic wellbeing under adjusted conditions.

8.1. Conclusions of the Mixed-Methods Study

In this study, a mixed-methods approach was utilised to enable meaningful understanding of relationships between academic achievement and academic wellbeing and classroom assessment adjustments for students with disabilities, which would be inexplicable using either approach alone. There are three main conclusions to be drawn from the mixed-methods approach:

- Australian students with disabilities in inclusive education in mainstream schools are not necessarily low achievers.
- The perception of Australian secondary students about academic abilities, especially in mathematics, is linked to their achievement level. They are mainly satisfied with school and tend to take more responsibility for success than failure.
- The academic achievement and academic wellbeing of students with disabilities are dependent on the provision of suitable adjustments to classroom assessment. Conversely, the lack of appropriate adjustments can damage the academic and emotional aspects of students with disabilities.

This study was framed through the biopsychosocial model of disability (World Health Organization [WHO], 2002), emphasising the interactional nature of disability with personal and environmental factors. According to the biopsychosocial approach, there are still barriers to accessing education for students with disabilities in mainstream Australian schools. The provision of adjustments principally depends on teacher awareness and knowledge of three elements. In addition to core professional knowledge of curriculum and assessment approaches, teachers need to be aware of and know about: the *health conditions* of students with disabilities that relate to their disabilities and impact on learning and assessment; the *psychosocial characteristics* of these students; and, the impact of the student's disabilities on *access and target skills* needed to undertake assessment related to educational curriculum.

As a starting point, such awareness can be enhanced through effective *communication* between teacher, student, and parent. The case study students and their parents in this study were very aware of the nature of students' disabilities and their effects on the assessment process. Including students and their parents in the decision-making process about adjustments can result in two important outcomes. *First*, teachers obtain first-hand knowledge and perceptions about the specific learning needs of students with disabilities and their health problems. This awareness enables teachers to identify functional impairments in student access, or target, skills more accurately and make more effective classroom assessment adjustments. Further, in the case that teachers have twice-exceptional students in their class, consultation with students and their parents helps teachers to provide specialised programs that match student strengths. Given that students with disabilities may need several modes of adjustments during assessments, regular communication among teachers, students and their parents enables the teachers to change some adjustments, as necessary, to be more effective. *Second*, providing opportunities for students with disabilities and their parents to discuss student learning needs and educational adjustments during regular meetings to plan the students' education programs will help students and their parents to clearly understand how adjustments may benefit them. Valuing the viewpoint of students with disabilities in selecting educational adjustments may also improve their academic wellbeing and academic success. Students with disabilities who perceive control over their educational environment, such as through consultation on needed adjustments, will have an increased sense of responsibility and engagement.

The need for professional development in the field of assessment adjustments has long been identified (Bolt & Thurlow, 2004), with enhanced initial teacher education in working with students with disabilities more recently noted to be a 'core requirement for all teachers' (Craven et al., 2014, p. 20). The Australian Professional Standards for Teachers (AITSL,

2017) require teachers to be capable of addressing the needs of students with diversity. Analysis of assessment tasks in terms of target and access skills provided a valuable process for considering the adjustments needed in classroom assessment tasks to suit the differing needs of the case study students due to disabilities. Professional development for teachers in the area of educational assessment is also noted to be a major need internationally.

Specific professional development for teachers is needed in the area of educational assessment for students with disabilities, learning how to examine assessment tasks in terms of the potential impact of the characteristics of students with disabilities and in terms of target and access skills, is a more specific need (Dembitzer & Kettler, 2018; Kettler & Elliott, 2010). Without appropriate professional development of teachers, students with disabilities will not receive the support they are legally entitled to and will be deprived of the quality of education provided to their peers. In Australia, the Nationally Consistent Collection of Data on School Students with Disability (NCCD) website is a source that provide a practical guide for educators to learn about the reasonable adjustments that Australian law expects schools to offer for students with disabilities (Education Services Australia, 2020a). Overall, adopting a biopsychosocial approach would help teachers to have a better understanding of the health status and psychosocial characteristics of students with disabilities when making adjustments to instruction and assessment.

8.2. Limitations of Study

Several limitations to the scope of the study should be acknowledged. First, in the qualitative strand of the study, the teachers, students, and parents who participated in this study were willing volunteers, after being approached as participants in the related ACAP study. Therefore, these self-selecting participants may be more actively engaged in the implementation of inclusive education than those in other educational settings. Seventeen participant groups —students, teachers, parents— were willing to participate in this extension study of ACAP. Four case studies were selected from these on the basis of several criteria. The disability characteristics of these case studies varied with a corresponding variety of educational assessment adjustments. However, the perspectives of these participants about the provided adjustments may not mirror the experiences of other students with disabilities more generally, and the findings of this study do not necessarily generalise to the achievement, academic wellbeing and provision of adjustments for all students with disability in mainstream schooling in Australia.

A second limitation is the reliance on self-report data in both strands of the study. In the quantitative strand of the study, the findings of academic wellbeing were obtained from student self-report scales, the Academic Wellbeing Questionnaire. Potentially, some students may have provided inaccurate information about their beliefs and feelings, that is, they chose responses that they considered were socially desirable, which would affect the validity of the findings. However, the overall consistency of the findings in this report with previous research, except for the findings for students' lack of internal responsibility for failure, indicated that this did not seem likely. With respect to internal responsibility for failure, arguably, students would consider reporting taking such responsibility for failure as more socially desirable than attribution of failure to external factors. In the qualitative strand of the study, in addition to the self-report Academic Wellbeing Questionnaire, data were collected through online surveys, and assessment artefacts uploaded by teachers to a virtual research site. No classroom observation was undertaken to examine inclusive education practices in situ. It was not possible to determine whether the teachers consistently made adjustments such as those uploaded, or whether the samples were exemplars. However, the nature of the data was extensive, with considerable opportunity for open-ended responses to hear the voices of the participants.

A third limitation is that, as the focus of the study was on adjustments provided to the case study students within classroom assessments, the perceptions and understandings about the nature of the students' disabilities and appropriate adjustments were only explored with the students' general classroom teachers. The study did not seek views of specialist teaching staff who supported the students in school. Aspects of their views were obtained indirectly. For the case study students, the teachers reported that information regarding the nature of their students' disabilities and recommended adjustments was provided by specialist support staff.

A final limitation reflects the scant previous research evaluating the impact of adjustments on the validity of classroom assessment tasks. Academic judgements were therefore made ex post facto about the effect of adjustments provided in this study on factors such as the cognitive demands of the adjusted tasks. This is discussed further in the following sections.

8.3. Recommendations for Future Research

The findings of this study have important implications for future research. First, a majority of research studies in inclusive education have used the social model of disability as a framework to consider the barriers that students with disabilities face in school. This study specifically identified some barriers to providing classroom assessment adjustments through the perception of students with disabilities using a biopsychosocial lens. However, further studies are needed to investigate the effectiveness of adjustments on students' wellbeing and academic achievement using the biopsychosocial model of disability.

The qualitative strand of this study supported the differential boost hypothesis (Sireci et al., 2005). In this study, a differential boost was found when the achievement of a student with disabilities was compared with their previous achievement under unadjusted or inappropriately adjusted conditions. Many studies have used the differential boost hypothesis to assess the validity of adjustments but with emphasis on student achievement outcomes. This study showed that when assessment task is accessible for students with disabilities, the students' academic achievement and academic wellbeing, as conceptualised in this study, were improved. Further in-depth research examining the relationship between provision of adjustments and academic wellbeing is warranted.

This study's findings suggest that the relationship between mathematics achievement and school satisfaction may be mediated by mathematics self-concept. Although the mediating role of academic self-concept has not been examined in this study, more research is needed. The conceptualisation of academic self-concept in this study was through the Big-Fish-Little-Pond Effect model (BFLPE; Marsh, 1984). Most studies of the BFLPE model have been undertaken with students without disabilities, limited studies have been conducted with students with disabilities. This study confirmed and extended the applicability of the BFLPE model for students with disability. Given that self-concept is considered a decisive factor of wellbeing (Kavanagh, 2020), further studies are warranted with low-achieving students with disabilities in mainstream classrooms. Such studies could examine not only whether the students' low achievement is related to their self-concept and school satisfaction but also whether their achievement and hence self-concept and satisfaction may be enhanced through provision of assessment adjustments. Data collection in the current study was cross-sectional, involving teachers, students and parents over one short period of instruction. Longitudinal studies examining the effectiveness of adjustments would be informing for future inclusive educational practice.

An interesting finding of the study was that students both with and without disabilities are more likely to take internal responsibility for academic success than failure, that is, are less likely to take responsibility for their academic failure. Interpretation of this finding is constrained by the low internal reliability of the scale used to measure this outcome. However, taking responsibility for learning is seen as an important component in student self-regulation of learning. Further research is needed to examine this finding occurs with larger groups of students, both with and without disabilities. If validated, further research may examine whether values in education have changed so that students do not perceive failure as resultant from their own (lack of) effort.

Furthermore, research into the effects of classroom assessment adjustments on the academic achievement and academic wellbeing of students with disabilities must continue to enhance awareness of education staff about the learning needs of students with disabilities in mainstream settings. As previously mentioned, at the school level, the qualitative strand of the study was limited to the perspectives of four general teachers; special teachers may have different perspectives on provision of educational adjustments. To obtain a detailed picture of providing classroom assessment adjustments, further research is warranted to explore wider viewpoints.

As previously mentioned, the data informing this study were derived from semi-structured surveys to gain participants' perspectives (students, mothers, teachers). The study did not involve direct observation of classroom practice or interviews. There is a need for further research that includes observations of actual practices in determining adjustments in assessment in classroom settings (Finkelstein et al., 2021). For example, the quality of the communication between a scribe and the student could be carefully investigated through direct observations. Gathering data through direct observations helps to uncover data that cannot be obtained through a survey (Creswell & Creswell, 2018; Finkelstein et al., 2021). Thus, the use of multiple data collection methods (e.g., survey, interview, observation) to explore processes that teachers use to make adjustments for students, in instruction as well as in assessment, will extend the findings of this study.

A final recommendation for further research relates to studies on validity and integrity of adjusted assessments. Validity and integrity become the most contentious issues in the field, and problematic for teachers, when such assessments are used for grading and reporting student outcomes in comparison with peers. Research to date has focused on effects of adjustments to standardised tests and conditions, with limited attention to teacher-designed classroom assessment tasks. In this study, available frameworks were used to make judgements about the effects of adjustments on the validity of the tasks and the study contributes to the field in this area. However, it is an area where more practical research exploring assessment adjustments and task validity is needed. Potentially such studies, rather than examining only differential boost effects for students with disabilities in comparison with students without disabilities, or the outcomes for students with disabilities on tasks with or without adjustments, could use processes such as verbal protocols to examine the cognitive engagement of students when undertaking assessment tasks.

8.4. Final Conclusion

This study has demonstrated that Australian education has strong inclusive education policies and legal frameworks in place, echoing international policy direction, to support the education of students with disabilities in Australia. This study does not provide evidence of the nature of inclusive education provision across Australia and the wider education context. However, it does provide evidence of what has, and can be done, in mainstream schooling under the inclusive education policies and curriculum and assessment contexts of Australia.

Overall, the teachers in the study demonstrated willingness to engage with inclusive education and to provide adjustments to student assessments to enable students with disabilities to demonstrate their knowledge. The study adds to existing research knowledge on academic achievement and academic wellbeing of students with disabilities in inclusive mainstream schooling. The model presented in Figure 7.2 demonstrates and endorses the relevance of the biopsychosocial model of disability to educational practice. The findings of this study, using social-cognitive theory, extend knowledge about reciprocal interactions between triadic factors — personal (e.g., academic self-concept, social comparisons), behavioural (e.g., academic achievement) and environmental factors (e.g., educational adjustments) in inclusive schooling. When students are provided with adjustments in assessment that enable them to demonstrate their knowledge, their achievement and academic wellbeing benefit.

Previous research has not examined the effects of adjustments in student assessments from both quantitative and qualitative perspectives. As Figure 7.2 demonstrates, the integration of the quantitative findings, replicating previous research findings in general, with the nuanced understanding of assessment adjustments in practice as demonstrated in the case studies, assists understanding of how the interaction of teaching, learning, assessment, and adjustments for students with disabilities can enhance or impair student learning outcomes.

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Appendix A: Ethical Clearance Advice

Australian Catholic University

Australian Catholic University
Human Research Ethics Committee
Project Approval Certificate

Chief Investigator/Supervisor:	Professor Joy Cumming
Co-Investigators:	Dr Ameneh Shahaeian and Professor Claire Wyatt-Smith
Student Researcher:	Maryam Razmjoee
Project title:	*Classroom assessment adjustments, and academic and life outcomes for students with disability*
Project approval date:	2 July 2018
Project approval end date:	31 October 2020
Human Research Ethics Committee (HREC) Register Number:	2018-51H

This is to certify that the above application has been reviewed by the Australian Catholic University Human Research Ethics Committee (ACU HREC). The application has been approved for the period given above.

Continued approval of this research project is contingent upon the submission of an annual progress report which is due on/before each anniversary of the project approval. A final report is due upon completion of the project. A report proforma can be downloaded from the website (link below).

Researchers are responsible for ensuring that all conditions of approval are adhered to and that any modifications to the protocol, including changes to personnel, are approved prior to implementation. In addition, the ACU HREC must be notified of any reportable matters including, but not limited to, incidents, complaints and unexpected issues.

Researchers are also responsible for ensuring that they adhere to the requirements of the *National Statement on Ethical Conduct in Human Research*, the *Australian Code for the Responsible Conduct of Research* and the University's *Research Code of Conduct*.

Any queries relating to this application should be directed to the Research Ethics and Integrity Office (Res.Ethics@acu.edu.au).

Kind regards,

[redacted]

28/11/2019

Nina Robinson
Research Ethics & Integrity Officer
On behalf of the ACU HREC Chair, Associate Professor Michael Baker

Research Ethics and Integrity | Research Services, Office of the Deputy Vice-Chancellor (Research)
Australian Catholic University
T: +61 2 9739 2646
E: Res.Ethics@acu.edu.au
W: ACU Research Ethics and Integrity

Approval to Conduct Research in Queensland State Schools

Queensland Government

Department of Education

8 April 2019

Dear Colleague,

Ms Maryam Razmjoee of Australian Catholic University has the Department's permission to approach your school inviting participation in the research project titled *'Classroom adjustments, and academic and life outcomes for students with disability'.*

The acceptance of the invitation to participate is entirely voluntary and at your discretion.

This letter provides you with information about the Department's terms and conditions for research conducted on state school sites to inform your decision as to whether or not your school will participate in this research. The Department supports the conduct of quality research in State schools and values the potential contribution of good research in informing educational policy and professional practice. Participation in research, however, may impact on the daily operations of schools, and it is therefore imperative that discretion is used when deciding whether to agree to research involving your school.

As a minimum, the researcher should provide you with the following documentation to inform your decision regarding school research participation:

- an information statement which describes the research, identifies who will be involved (e.g. students, teachers, parents/caregivers) and explains what will be required of these participants;
- the informed consent form for you to sign to indicate your agreement that school staff, students and/or parents/caregivers can be invited to participate in the research;
- a copy of the approval to approach letter from central office or a regional office (where applicable);
- a copy of the final ethical clearance from their institution's Human Research Ethics Committee;
- full copies of any data collection instruments such as surveys, questionnaires, and interview schedules to be used in the study;
- a copy of all current Blue Cards and/or exemption notices from Blue Card Services at www.bluecard.qld.gov.au for any researcher(s) seeking access to children on school sites.

Most importantly, participation in any research is voluntary, and you have the right to decline your school's participation in a research project, even if approval to approach your school has been granted at central office or regional level. It is also recommended that you monitor any research activities conducted in your school and you may, if you wish, withdraw your support for the research study at any time without penalty.

Research Showcase 2019 FORUM SERIES

Education House
30 Mary Street Brisbane 4000
PO Box 15033 City East
Queensland 4002 Australia
Telephone (07) 303 45929
Website www.det.qld.gov.au
ABN 76 337 613 647

At the conclusion of research involving your school, the researchers are required to provide you and participants with a written report summarising the main findings of the study. They are also required to submit a summary of findings to the Queensland Education Research Inventory (QERI) at https://research.det.qld.gov.au .

Should you require further information on the research application process, please feel free to contact Research Officer, Sara Ellis, Strategic Policy and Intergovernmental Relations on (07) 3034 5984. Please quote the file number 550/27/2126 in future correspondence.

Yours sincerely

[redacted]

Rebecca Libke
A/Director
Research Services
Strategic Policy and Intergovernmental Relations

ES

ELLIS, Sara <Sara.ELLIS@qed.qld.gov.au>
Thu 28/11/2019 1:31 PM
Maryam Razmjoee

Hi Maryam

Your request to extend the completion date of your research to June 2020 is approved.
Please retain this email as evidence of approval.

Kind regards
Sara Ellis
Senior Research Officer
Research Services, Policy Directions
Strategic Policy & Intergovernmental Relations
Department of Education

P: 07 3034 5945
E: sara.ellis@qed.qld.gov.au
Level 21 | Education House | 30 Mary Street | Brisbane QLD 4000
PO Box 15033 | City East QLD 4002
Working together to lift learning and skilling outcomes for Queensland.
Please consider the environment before printing this email.

Queensland Government

Approval to Conduct Research in Victorian State Schools

Department of
Education & Training

2 Treasury Place
East Melbourne Victoria 3002
Telephone: 03 9637 2000
DX210083

2018_003782

Ms Maryam Razmjoee
Institute for Learning Sciences and Teacher Education
Australian Catholic University
Level 4, 229 Elizabeth Street
BRISBANE QLD 4001

Dear Ms Razmjoee

Thank you for your application of 29 June 2018 in which you request permission to conduct research in Victorian government schools titled *Classroom assessment adjustments, and academic and life outcomes for students with disabilities.*

I am pleased to advise that on the basis of the information you have provided your research proposal is approved in principle subject to the conditions detailed below.

1. Department approved research projects currently undergoing a Human Research Ethics Committee (HREC) review are required to provide the Department with evidence of the HREC approval once complete.

2. The research is conducted in accordance with the final documentation you provided to the Department of Education and Training.

3. Separate approval for the research needs to be sought from school principals. This is to be supported by the Department of Education and Training approved documentation and, if applicable, the letter of approval from a relevant and formally constituted Human Research Ethics Committee.

4. The project is commenced within 12 months of this approval letter and any extensions or variations to your study, including those requested by an ethics committee must be submitted to the Department of Education and Training for its consideration before you proceed.

5. As a matter of courtesy, you advise the relevant Regional Director of the schools that you intend to approach. An outline of your research and a copy of this letter should be provided to the Regional Director or governing body.

6. You acknowledge the support of the Department of Education Training in any publications arising from the research.

VICTORIA State Government

7. The Research Agreement conditions, which include the reporting requirements at the conclusion of your study, are upheld. A reminder will be sent for reports not submitted by the study's indicative completion date.

I wish you well with your research. Should you have further questions on this matter, please contact Youla Michaels, Project Support Officer, Insights and Evidence Branch, by telephone on (03) 7022 0306 or by email at michaels.youla.y@edumail.vic.gov.au.

Yours sincerely

[redacted]

Zoran Endekov
Senior Research Officer
Insights and Evidence

3/08/2018

VICTORIA State Government

Appendix B: Information Letters for Principals, Teachers, Parents and Students

PRINCIPAL INFORMATION LETTER

Dear ……………………………

I would like to invite you to participate in my PhD research project described below. My PhD project investigates how students think about themselves, their school, and what their attitudes are to their academic achievement. It will examine differences in attitudes for students who have adjustments for disability reported on the NCCD and students who do not have such adjustments reported.

What will my teachers and students be asked to do?
This project will involve you, your teachers, and your students in two or more class groups which incorporate students without disability and students who have had an adjustment for disability reported by your school on the NCCD.
Students and their parents will also be asked to consent to participation in the project. In this project, you will be asked to:

- provide teachers with the Information Letter and Consent Form provided;
- provide information held at school level regarding reported adjustments (Type of adjustment, the level of adjustment and the category of disability) on the Nationally Consistent Collection of Data for the classroom students who complete the survey.
- provide a copy of the students' most recent English and mathematics results and NAPLAN results of participating students, given participating students' consent.
- de-identify student information before providing to the researcher.

The main activity of the project is student completion of the School Life Questionnaire, described below. Your teachers will be asked to distribute and collect Information Letters and Consent Forms to parents and students in the classes. They will also administer the questionnaire to all consenting students within the selected classes. Based on feedback from schools currently involved in this research, the preference is for teachers to take responsibility for the information and consent forms for students in their class, and for the questionnaire to be in paper-and-pencil questionnaire format, rather than online. Printed copies of the questionnaire can be posted to your schools with a registered reply paid envelope for return.

Students will be asked to complete the questionnaire[1]. The questionnaire has three sections that ask students about how satisfied they are with school (such as *I like being in school*), how they think and feel about themselves (such as *I do well in English classe*s) and what their attitudes are to their academic achievement (such as *I do well on a test at school because I study hard*).

How much time will the project take?
This project will involve you or your staff in providing the researcher with the most recent English/mathematics grades, NAPLAN results and the NCCD information for participating students. It is anticipated that this will require approximately 10 minutes. It is expected that students will take a maximum of 40 minutes on the questionnaire.

What are the benefits of the research project?

For students, project participation may result in a better understanding of the purpose of assessment and their role in assessment and assessment adjustments, and their academic success. The findings of this project may develop the awareness of the role of motivating beliefs as non-academic skills in achieving students' academic success and the relationship to disability for some students.

Are there any risks associated with participating in this project?

All (de-identified) information collected is secured in a locked cabinet at the Institute for Learning Sciences & Teacher Education (ILSTE) office of the Australian Catholic University in line with ethical guidelines for safe use and storage of data. All information including: students' personal information (student's name, Year level, English and mathematics grades, NAPLAN results, and the NCCD information), and the name of your school will only be accessed by the project research team (Please see attached information). Therefore, participation in this project has no foreseeable risks for students or schools.

Can I withdraw from the project?

Participation in this project is completely voluntary. Your school is not under any obligation to participate. If you agree for your school to participate, you can withdraw from the project at any time without adverse consequences.

Will anyone else know the results of the project?

The results of the questionnaire will appear in a doctoral thesis and be shared with the education community. Any reference to participants or the name and location of their school removed. In addition, a summary report of results will be provided for participating schools after this project is completed. It is anticipated that this will be during Term 2 of 2019.

Who do I contact if I have questions about the project?

Please contact me, Ms Maryam Razmjoee, through email (maryam.razmjoee@myacu.edu.au) if you have any questions about this project. Should you wish to speak to my principal supervisor, then please contact Professor Joy Cumming via email (joy.cumming@acu.edu.au) or phone 07 3623 7862.

What if I have a complaint or any concerns?

The project has been approved by the Human Research Ethics Committee at Australian Catholic University (the HREC number: 2018-51H). If you have any complaints or concerns about the conduct of the project, you may write to the Manager of the Human Research Ethics Committee care of the Office of the Deputy Vice Chancellor (Research).

Manager, Ethics
c/o Office of the Deputy Vice Chancellor (Research) Australian Catholic University
North Sydney Campus
PO Box 968
NORTH SYDNEY, NSW 2059
Ph.: 02 9739 2519
Fax: 02 9739 2870
Email: resethics.manager@acu.edu.au
Any complaint or concern will be treated in confidence and fully investigated. You will be informed of the outcome. I want to participate! How do I sign up?
If you would like your school to participate in this project, please complete both copies of the attached Principal Consent Form. This form can be scanned and sent back to maryam.razmjoee@myacu.edu.au. Alternatively, the researcher can collect the Principal Consent

Form from your school.

Yours sincerely
Maryam Razmjoee

TEACHER INFORMATION LETTER

Dear teacher,

I would like to invite you to participate in my PhD research project described below. My PhD project investigates how students think about themselves, their school, and what their attitudes are to their academic achievement.

What will I be asked to do?

The main activity of the project is student completion of a questionnaire, described below. In this project, you will be asked to:

- distribute and collect Information Letters and Consent Forms to parents and students in your class;
- administer the questionnaire to all consenting students within the class.

Based on feedback from schools currently involved in this research, the preference is for teachers to take responsibility for the information and consent forms for students in their class, and for the questionnaire to be in paper-and-pencil questionnaire format, rather than online.

The questionnaire has three sections that ask students about how satisfied they are with school (such as *I like being in school*), how they think and feel about themselves (such as *I do well in English class*es) and what their attitudes are to their academic achievement (such as *I do well on a test at school because I study hard*). It is expected that students will take a maximum of 40 minutes on the questionnaire.

Are there any risks associated with participating in this project?

The school will be responsible for de-identifying student information before providing to the researcher. All (de- identified) information collected is secured in a locked cabinet at the Institute for Learning Sciences & Teacher Education (ILSTE) office of the Australian Catholic University in line with ethical guidelines for safe use and storage of data. All information including: students' personal information and their parents, your name, and the name of your school will only be accessed by the project research team (Please see attached information). Therefore, participation in this project has no foreseeable risks for students or schools. However, if your students find any questions have upset them, and they would like to talk to someone about this, they can phone: Kids Helpline on 1800 55 1800.

Who do I contact if I have questions about the project?

Please contact me, Ms Maryam Razmjoee, through email (maryam.razmjoee@myacu.edu.au) if you have any question about this project. Should you wish to speak to my principal supervisor, then please contact Professor Joy Cumming via email (joy.cumming@acu.edu.au) or phone 07 3623 7862.

What are the benefits of the research project?

For students, project participation may result in a better understanding of the purpose of assessment and their role in assessment and their academic success. The findings of this project may develop the awareness of the role of motivating beliefs as non-academic skills in achieving students' academic success.

Can I withdraw from the project?
Participation in this project is completely voluntary. You are not under any obligation to participate. If you agree to participate, you can withdraw from the project at any time without having to explain.

Will anyone else know the results of the project?
The results of the questionnaire will appear in a doctoral thesis and be shared with the education community. Any reference to participants or the name and location of their school removed. In addition, a summary report of results will be provided for participating schools after this project is completed. It is anticipated that this will be during Term 2 of 2019.

What if I have a complaint or any concerns?
The project has been approved by the Human Research Ethics Committee at Australian Catholic University (the HREC number: 2018-51H). If you have any complaints or concerns about the conduct of the project, you may write to the Manager of the Human Research Ethics Committee care of the Office of the Deputy Vice Chancellor (Research).

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Fax: 02 9739 2870
Email: resethics.manager@acu.edu.au
Any complaint or concern will be treated in confidence and fully investigated. You will be informed of the outcome.

I want to participate! How do I sign up?
If you would like to participate in this project, please complete both copies of the attached Teacher Consent Form. This form can be scanned and sent back to maryam.razmjoee@myacu.edu.au. Alternatively, the researcher can collect the Teacher Consent Form from your school.

Yours sincerely
Maryam Razmjoee

PARENT/CARER INFORMATION LETTER

Dear parent/carer,

I would like to invite your child to participate in my PhD research project described below. My PhD project investigates how students think about themselves, their school, and what their attitudes are to their academic achievement.

What will I be asked to do?

I am asking for your consent for your child to participate in this project. This project will involve your child and classmates. I would like to ask your child to complete a questionnaire. The questionnaire has three sections that ask students about how satisfied they are with school (*such as I like being in school*), how they think and feel about themselves (*such as I do well in English classes*) and what their attitudes are to their academic achievement (*such as I do well on a test at school because I study hard*). It takes a maximum of 40 minutes and your child do this in the classroom.

In addition, I am asking for your *written consent* to allow your child's school to provide a copy of your child's (de-identified) most recent English and mathematics grades, NAPLAN results and information the school has recorded on the Nationally Consistent Collection of Data (NCCD). This will only be relevant for students for whom such information on adjustments has been recorded.

Are there any risks associated with participating in this project?

The school will be responsible for de-identifying student information before providing to the researcher. All information will be kept confidential in a locked cabinet in our university's office. All information including: students' personal information (student's name, Year level, English and mathematics grades, NAPLAN results, and the NCCD information), your name, and the name of school will only be accessed by the project research team (Please see attached information). Also the participation in this project has no risks for your child. However, if students find any questions have upset them, and they would like to talk to someone about this, they can phone: Kids Helpline on 1800 55 1800.

Who do I contact if I have questions about the project?

Please contact me, Ms Maryam Razmjoee, through email (maryam.razmjoee@myacu.edu.au) if you have any question about this project. Should you wish to speak to my principal supervisor, then please contact Professor Joy Cumming via email (joy.cumming@acu.edu.au) or phone 07 3623 7862.

What are the benefits of the research project?

For students, project participation may result in a better understanding of the purpose of assessment and their role in assessment and their academic success. The findings of this project may develop the awareness of the role of motivating beliefs as non-academic skills in achieving students' academic success.

Can I withdraw from the project?

Participation in this project is completely voluntary. Your child is not under any obligation to participate. If your child agrees to participate, she/he can withdraw from the project at any time without having to explain why.

Will anyone else know the results of the project?
The results of the questionnaire will appear in a doctoral thesis and be shared with the education community. Any reference to participants or the name and location of their school removed. In addition, a summary report of results will be provided for participating schools after this project is completed. It is anticipated that this will be during Term 2 of 2019.

What if I have a complaint or any concerns?
The project has been approved by the Human Research Ethics Committee at Australian Catholic University (the HREC number: 2018-51H). If you have any complaints or concerns about the conduct of the project, you may write to the Manager of the Human Research Ethics Committee care of the Office of the Deputy Vice Chancellor (Research).

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Ph: 02 9739 2519; Fax: 02 9739 2870
Email: resethics.manager@acu.edu.au
Any complaint or concern will be treated in confidence and fully investigated. You will be informed of the outcome.

I want to participate! How do I sign up?
If you would like that your child participate in this project, please complete both copies of the attached Parent Consent Form. This form can be scanned and sent back to maryam.razmjoee@myacu.edu.au. Alternatively, the researcher can collect the Parent Consent Form from your child's school.

Yours sincerely
Maryam Razmjoee

STUDENT INFORMATION LETTER

Dear student,

I would like to invite you to participate in my PhD research project described below. My PhD project investigates how students think about themselves, their school, and what their attitudes are to their academic achievement.

What will I be asked to do?

This project will involve yourself and your classmate in a classroom. Your parent or carer will also be asked for permission for you to participate in the project.

I would like to invite you to complete a questionnaire. The questionnaire has three sections that ask students

about how satisfied they are with school (*such as I like being in school*), how they think and feel about themselves (*such as I do well in English classes*) and what their attitudes are to their academic achievement (*such as I do well on a test at school because I study hard*). It takes up to 40 minutes and you will be in your classroom when you complete this.

I am also asking you to agree to the principal providing a copy of your most recent English and mathematics grades, NAPLAN results and information the school has recorded on the Nationally Consistent Collection of Data (NCCD). This will only be relevant for students for whom such information on adjustments has been recorded.

Are there any risks associated with participating in this project?

The school will be responsible for de-identifying student information before providing to the researcher. All information will be kept confidential in a locked cabinet in our university's office. All information including: students' personal information (student's name, Year level, English and mathematics grades, NAPLAN results, and the NCCD information), and the name of your school will only be accessed by the project research team (Please see attached information). Therefore, participation in this project has no foreseeable risks for students or schools. However, if you find any questions have upset you, and you would like to talk to someone about this, please phone: Kids Helpline on 1800 55 1800.

What are the benefits of the research project?

For students, project participation may result in a better understanding of academic success. The findings of this project may develop the awareness of the role of motivating beliefs as non-academic skills in achieving students' academic success.

Can I withdraw from the project?

Participation in this project is completely voluntary. You are not under any obligation to participate. If you agree to participate, you can withdraw from the project at any time without having to explain why.

Will anyone else know the results of the project?

The results of the questionnaire will appear in a doctoral thesis and be shared with the education community. Any reference to participants or the name and location of their school removed. In addition, a summary report of results will be provided for participating schools after this project is completed. It is anticipated that this will be during Term 2 of 2019.

Who do I contact if I have questions about the project?
Please talk to your teacher or parent/carer if you have any questions about this project. They can then help you contact me through email (maryam.razmjoee@myacu.edu.au). They can also contact my principal supervisor, Professor Joy Cumming via email (joy.cumming@acu.edu.au) or phone 07 3623 7862.

What if I have a complaint or any concerns?
The project has been approved by the Human Research Ethics Committee at Australian Catholic University (the HREC number: 2018-51H). If you have any complaints or concerns about the conduct of the project, please talk to your teacher or parent/carer. They may write to the Manager of the Human Research Ethics Committee care of the Office of the Deputy Vice Chancellor (Research).

Manager, Ethics
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Email: resethics.manager@acu.edu.au
Any complaint or concern will be treated in confidence and fully investigated. You will be informed of the outcome.

I want to participate! How do I sign up?
That would be great! Please complete both copies of the attached Student Consent Form, keep one copy for yourself and give one copy back to your teacher. I will then collect this form from your teacher.

Kind regards
[redacted]

Maryam Razmjoee

Appendix C: Consent forms for Principals, Teachers, Parents and Students

PRINCIPAL CONSENT FORM

PROJECT TITLE:	**Classroom assessment and academic and life outcomes for secondary school students**
SUPERVISORS:	**Professor Joy Cumming, Professor Claire Wyatt-Smith, Dr Ameneh Shahaeian**
STUDENT RESEARCHER:	**Maryam Razmjoee**

I understand that participation in this project is completely voluntary. If I agree for my school to participate, I can withdraw the school from the project at any time without adverse consequences.

I understand that the results of this project will appear in a doctoral thesis as well as academic publications, with any reference to participants or the name and location of the school removed. A summary report on the outcomes of questionnaires for all schools will also be provided after this project is completed.

Please indicate your preference below by ticking the appropriate box(s).

☐ I have read and understood the *Principal Information Letter*. Any questions I have asked have been answered to my satisfaction.

☐ **I agree** to my school's participation in the research project: *Adjustments and academic and life outcomes for secondary school students.*

☐ **I agree** that teachers distribute a questionnaire to all students within their classroom;

☐ **I agree** that students complete a questionnaire in the class time.

☐ **I agree** that the school will be responsible for de-identifying student information before providing to Ms Razmjoee

☐ **I agree** that the school will provide a copy of participating students' (de-identified) most recent English and mathematics grades and NAPLAN results and students' achievement results (given parent's written consent);

☐ **I agree** that the school will provide information held at school level regarding reported adjustments (Type of adjustment, the level of adjustment and the category of disability) on the Nationally Consistent Collection of Data for the classroom students who complete the survey.

☐ **I do not agree** to my school's participation in the research project: *Adjustments and academic and life outcomes for secondary school students.*

NAME OF PRINCIPAL .... SCHOOL: ....
SIGNATURE: .... DATE: ....
NOMINATED LIAISON OFFICER: ....
POSITION: ....
EMAIL ADDRESS: ………………………………………………………………………
SIGNATURE OF RESEARCHER: .... DATE: ....

Please scan and email this copy to maryam.razmjoee@myacu.com.au

TEACHER CONSENT FORM

PROJECT TITLE:	Classroom assessment and academic and life outcomes for secondary school students
SUPERVISORS:	Professor Joy Cumming, Professor Claire Wyatt-Smith, Dr Ameneh Shahaeian
STUDENT RESEARCHER	Maryam Razmjoee

I understand that participation in this project is completely voluntary. If I agree to participate, I can withdraw from the project at any time without adverse consequences.

I understand that the results of this project will appear in a doctoral thesis as well as academic publications, with any reference to participants or the name and location of the school removed.

Please indicate your preference below by ticking the appropriate box(s).

☐ I have read and understood the *Teacher Information Letter*. Any questions I have asked have been answered to my satisfaction.

☐ **I agree** to participate in the research project: *Adjustments and academic and life outcomes for secondary school students.*

☐ **I agree** to distribute and collect information letters and consent forms for parents and students and a questionnaire to my classroom. I will also be involved in monitoring survey completing by students within my classroom.

☐ **I do not agree** to participate in the research project: *Adjustments and academic and life outcomes for secondary school students.*

NAME OF TEACHER: .... SCHOOL:............................
TEACHER'S EMAIL ADDRESS: ....
SIGNATURE: ....
DATE:...
SIGNATURE OF RESEARCHER: ....
DATE: ………………………..……………………………

Please scan and email this copy to maryam.razmjoee@myacu.com.au

PARENT/CARER CONSENT FORM

PROJECT TITLE: Classroom assessment and academic and life outcomes for secondary school students

SUPERVISORS: Professor Joy Cumming, Professor Claire Wyatt-Smith, Dr Ameneh Shahaeian

STUDENT RESEARCHER Maryam Razmjoee

I understand that my child's participation in this project is completely voluntary. If my child agrees to participate, she/he can withdraw from the project at any time without adverse consequences.

I understand that the results of this project will appear in a doctoral thesis as well as academic publications, with any reference to participants or the name and location of the school removed.

Please indicate your preference below by ticking the appropriate box(s).

☐ I have read and understood the *Parent/Carer Information Letter*. Any questions I have asked have been answered to my satisfaction.

☐ **I agree** that my child may participate in the research project: *Adjustments and academic and life outcomes for secondary school students.*

☐ I understand that my child will be asked to complete a questionnaire.

I agree for Ms Razmjoee to:

☐ access a copy of my child's (de-identified) most recent English and mathematics grades and NAPLAN results and students' achievement result and information the school has recorded on the Nationally Consistent Collection of Data (NCCD). This will only be relevant for students for whom such information on adjustments has been recorded.

☐ **I do not agree** to my child's participation in the research project: *Adjustments and academic and life outcomes for secondary school students.*

YOUR NAME: ………………………… CHILD'S NAME:…………………………
NAME OF SCHOOL:…………………………………
YOUR SIGNATURE:…………………………… DATE: ……………..………………
SIGNATURE OF MS RAZMJOEE:…………………………………………
DATE: ……………..…..…………
Please return this form to your child's teacher, or scan and email to maryam.razmjoee@myacu.edu.au

STUDENT CONSENT FORM

PROJECT TITLE:	Classroom assessment and academic and life outcomes for secondary school students
SUPERVISORS:	Professor Joy Cumming, Professor Claire Wyatt-Smith, Dr Ameneh Shahaeian
STUDENT RESEARCHER	Maryam Razmjoee

I understand that participation in this project is completely voluntary. If I agree to participate, I can withdraw from the project at any time without having to explain why.

I understand that the results of this project will appear in a doctoral thesis as well as academic publications, with any reference to participants or the name and location of the school removed.

Please indicate your preference below by ticking the appropriate box(s).

☐ I have read and understood the Student Information Letter. Any questions I have asked have been answered to my satisfaction.

☐ **I agree** to participate in the research project: *Adjustments and academic and life outcomes for secondary school students.*

☐ I will complete a questionnaire within the classroom.

I agree for Ms Razmjoee to:

☐ access a copy of my (de-identified) most recent English and mathematics grades and NAPLAN results and students' achievement results and information the school has recorded on the Nationally Consistent Collection of Data (NCCD). This will only be relevant for students for whom such information on adjustments has been recorded.

☐ **I do not agree** to participate in the research project: *Adjustments and academic and life outcomes for secondary school students.*

NAME OF STUDENT: …………………………………………………
NAME OF PARENT: ………………….………………………………..
NAME OF SCHOOL: …………………………………………………
SIGNATURE OF STUDENT: ....
DATE: ....
SIGNATURE OF RESEARCHER: ....
DATE: ....

Please return this consent form to your teacher. *For further information, please contact me, Ms Razmjoee, through* maryam.razmjoee@myacu.edu.au

Appendix D: Academic Wellbeing Questionnaire

Dear student,

Thank you for agreeing to participate in this research project. Over the page, is a questionnaire about how you feel about your learning and school.

It is **NOT** a test. There are **NO** right or wrong answers. It may take approximately 40 minutes to complete. Please answer every question.

Your name will be removed from your answers and you will be given a code.
You, your parents, your teachers and your school will not be identifiable in any publication based on this research.

If you agree to participate, you can withdraw from the project at any time without having to explain why.

The questionnaire consists of three sections. We want to find out about your experiences. Please read the instructions carefully in each section.

We very much appreciate your assistance in completing the questionnaire and look forward to sharing our findings with the education community.

Maryam Razmjoee
Joy Cumming
Institute for Learning Sciences and Teacher Education
Australian Catholic University

Background Information

Name of student ☐

Gender: Girl ☐ Boy ☐

How old are you ☐

What Year level are you currently in?

Year 7 ◯ Year 8 ◯ Year 9 ◯ Year 10 ◯ Year 11 ◯

Section 1: Intellectual Achievement Responsibility Questionnaire

I would like to know **what your attitudes are to your academic achievement**. Read each question carefully and tick (✓) one box that best matches your opinion. First impressions are usually best. **Please do not leave any statement blank**.

1. When you do well on a test at school, it is more likely to be because

☐ you studied for it
OR
☐ the test was especially easy

2. When you have trouble understanding something in school, it is usually because

☐ the teacher didn't explain it clearly
OR
☐ you didn't listen carefully

3. If your parents say you are doing well in school, this is likely to happen because

☐ your schoolwork is good
OR
☐ they are in a good mood

4. If you did better than usual in a subject at school, it would probably happen because

☐ you tried harder
OR
☐ someone helped you

5. If a boy or girl tells you that are "dumb", it is more likely that they say that because

☐ they are mad at you
OR
☐ what you did really wasn't very smart

6. If a teacher says to you, "Your work is fine", it is because

☐ It is something teachers usually say to encourage pupils
OR
☐ you did a good job

7. If you find it hard to work maths problems at school, it is because

☐ you didn't study well enough before you tried them
OR
☐ the teacher gave problems that were too hard

8. If you weren't sure about the answer to a question your teacher asked you, but your answer turned out to be right, it is likely to happen because

☐ she wasn't as particular as usual
OR
☐ you gave the best answer you could think of

9. If you read a story and remember most of it, it is usually because

☐ you were interested in the story
OR
☐ the story was well written

10. If your parents tell you you're acting silly and not thinking clearly, it is more likely to be

☐ because of something you did
OR
☐ because they happen to be feeling cranky

11. If people think you're clever, it is because

☐ they happen to like you
OR
☐ you usually act that way

12. If you don't do as well as usual in a subject at school, this would probably happen because

- ☐ you weren't as careful as usual

OR

- ☐ somebody bothered you and kept you from working

13. When you remember something you heard in class, it is usually because

- ☐ you tried hard to remember

OR

- ☐ the teacher explained it well

14. If you can't do a puzzle, it is more likely to happen because

- ☐ you are not very good at working puzzles

OR

- ☐ the instructions weren't written clearly

Section 2: Self Description Questionnaire II: There are **30** statements below. I would like to know ***how you think and feel bout yourself***. Please read carefully each sentence and choose an answer that is best for you. If you feel the statement is **completely untrue**, put a tick (✓) in the first column. Please answer for each statement.

		Untrue	Mostly untrue	More untrue than true	More true than untrue	Mostly true	True
1	**Maths** is one of my best subjects	☐	☐	☐	☐	☐	☐
2	I am hopeless in **English** classes	☐	☐	☐	☐	☐	☐
3	People come to me for help in most school subjects	☐	☐	☐	☐	☐	☐
4	I often need help in **maths**	☐	☐	☐	☐	☐	☐
5	I look forward to **English** classes	☐	☐	☐	☐	☐	☐
6	I think I do not do well enough at school to get into university	☐	☐	☐	☐	☐	☐
7	I look forward to **maths** classes	☐	☐	☐	☐	☐	☐
8	I do badly on tests that need a lot of reading ability	☐	☐	☐	☐	☐	☐
9	If I work really hard, I could be one of the best students in my school year	☐	☐	☐	☐	☐	☐
10	I have trouble understanding anything with **maths** in it	☐	☐	☐	☐	☐	☐
11	The work in **English** classes is easy for me	☐	☐	☐	☐	☐	☐
12	I get bad marks in most school subjects	☐	☐	☐	☐	☐	☐
13	I enjoy doing for **maths**	☐	☐	☐	☐	☐	☐
14	I am okay at reading	☐	☐	☐	☐	☐	☐

		Untrue	Mostly untrue	More untrue than true	More true than untrue	Mostly true	True
15	I learn things quickly in most school subjects	☐	☐	☐	☐	☐	☐
16	I do badly in **maths** tests	☐	☐	☐	☐	☐	☐
17	**English** is one of my best subjects	☐	☐	☐	☐	☐	☐
18	I do not do very well in most school subjects	☐	☐	☐	☐	☐	☐
19	I get good marks in **maths**	☐	☐	☐	☐	☐	☐
20	I hate **reading**	☐	☐	☐	☐	☐	☐
21	I do well in tests in most school subjects	☐	☐	☐	☐	☐	☐
22	I never want to take another **maths** course	☐	☐	☐	☐	☐	☐
23	I get good marks in **English**	☐	☐	☐	☐	☐	☐
24	I have trouble with most school subjects	☐	☐	☐	☐	☐	☐
25	I have always done well in **maths**	☐	☐	☐	☐	☐	☐
26	I have trouble expressing myself when I try to write something	☐	☐	☐	☐	☐	☐
27	I am good at most school subjects	☐	☐	☐	☐	☐	☐
28	I hate **maths**	☐	☐	☐	☐	☐	☐
29	I learn things quickly in **English** classes	☐	☐	☐	☐	☐	☐
30	Most school subjects are just too hard for me	☐	☐	☐	☐	☐	☐

Section 3: Students' School Satisfaction

I would like to know how satisfied you are with school ***<u>during the past several weeks</u>.*** It is important to know what you **REALLY think**, so please answer the question the way you **REALLY feel**, not how you think you should.

Please place a tick (✓) in one column for each statement how much you agree or disagree with each statement. Please **do not leave any statement blank.**

	Strongly agree	Mostly agree	More agree than disagree	**More disagree than agree**	Mostly disagree	Strongly disagree
1. I like being in school	☐	☐	☐	☐	☐	☐
2. I learn a lot at school	☐	☐	☐	☐	☐	☐
3. There are many things about school I don't like	☐	☐	☐	☐	☐	☐
4. I wish I didn't have to go to school	☐	☐	☐	☐	☐	☐
5. I look forward to going to school	☐	☐	☐	☐	☐	☐
6. I feel bad at school	☐	☐	☐	☐	☐	☐
7. School is interesting	☐	☐	☐	☐	☐	☐
8. I enjoy school activities	☐	☐	☐	☐	☐	☐

Appendix E: Case Study Students' Responses to Academic Wellbeing Questionnaire

Summary of Responses **by** Case Study Students to the **Self Description Questionnaire—**Academic Subscale

Statements	Liam	Leo	Alfie	Ava	Daniel
Mathematics self-concept					
Maths is one of my best subjects	True	Mostly true	Mostly true	More true than untrue	Mostly untrue
I often need help in maths	Untrue	More untrue than true	Mostly untrue	More untrue than true	True
I look forward to maths classes	True	Mostly true	Mostly true	More untrue than true	Mostly untrue
I have trouble understanding anything with maths in it	Untrue	Untrue	Mostly untrue	Mostly untrue	True
I enjoy doing maths	True	Mostly true	True	Mostly true	Mostly untrue
I do badly in maths test	Untrue	Untrue	Untrue	More untrue than true	True
I get good marks in maths	True	True	True	True	Untrue
I never want to take another maths course	Untrue	More true than untrue	Mostly untrue	Mostly untrue	True
I have always done well in maths	True	More true than untrue	More true than untrue	More untrue than true	Untrue
I hate maths	Untrue	Untrue	Mostly untrue	Untrue	True
English self-concept					
I am hopeless in English classes	Untrue	More true than untrue	More true than untrue	More true than untrue	Mostly true
I look forward to English classes	Mostly true	Mostly true	More true than untrue	Mostly untrue	Mostly untrue
I do badly on tests that need a lot of reading ability	Untrue	More true than untrue	More true than untrue	More untrue than true	True
The work in English classes is easy for me	Mostly true	More untrue than true	Mostly untrue	Mostly untrue	Mostly untrue
I have trouble expressing myself when I try to write	Mostly untrue	True	Mostly true	Mostly true	True
English is one of my best subjects	Mostly true	More true than untrue	More untrue than true	Mostly untrue	Untrue
I hate reading	Untrue	More true than untrue	More true than untrue	Untrue	True
I get good marks in English	True	True	More untrue than true	More true than untrue	Untrue
I learn things quickly in English classes	True	More true than untrue	More true than untrue	Mostly untrue	Untrue
I am okay at reading	More untrue	More untrue than true	More untrue than true	True	More untrue
General self-concept					
People come to me for help in most school subjects	Mostly true	More true than untrue	More true than untrue	Mostly untrue	Untrue
I think I do not do well enough at school to get into university	Untrue	More true than untrue	Mostly untrue	More untrue than true	True
I learn things quickly in most school subjects	True	Mostly true	More true than untrue	More untrue than true	Untrue
I get bad marks in most school subjects	untrue	Untrue	Mostly untrue	Untrue	True
If I work really hard, I could be one of the best students	True	Mostly true	More true than untrue	Mostly untrue	Mostly untrue
I do not do very well in most school subjects	Untrue	Untrue	Mostly untrue	Untrue	True
I do well in tests in most subjects	True	Mostly true	Mostly true	Mostly true	Untrue
I have trouble with most school subjects	Untrue	More untrue than true	Mostly untrue	Mostly untrue	True
I am good at most school subjects	True	Mostly true	More true than untrue	More true than untrue	Untrue
Most school subjects are just too hard for me	Untrue	More untrue than true	More untrue than true	Untrue	True

Summary of Responses **by** Case Study Students to the **Intellectual Achievement Responsibility Scale**

Statements	Liam	Leo	Alfie	Daniel
IR-success				
When you do well on a test at school, it is more likely to be because	the test was especially easy	you studied for it	the test was especially easy	the test was especially easy
If your parents say you are doing well in school, this is likely to happen because	your schoolwork is good	your schoolwork is good	your schoolwork is good	your schoolwork is good
If you did better than usual in a subject at school, it would probably happen because	you tried harder	someone helped you	you tried harder	because someone helped you
If a teacher says to you, "Your work is fine", it is because	you did a good job	you did a good job	you did a good job	it is something teachers usually say to encourage pupil
If you weren't sure about the answer to a question your teacher asked you, but your answer turned out to be right, it is likely to happen because	you gave the best answer you could think of	you gave the best answer you could think of	you gave the best answer you could think of	you gave the best answer you could think of
If you read a story and remember most of it, it is usually because	you were interested in the story	you were interested in the story	you were interested in the story	you were interested in the story
If people think you're clever, it is because	you usually act that way	you usually act that way	you usually act that way	they happen to like you
When you remember something, you heard in class, it is usually because	the teacher explained it well	the teacher explained it well	you tried hard to remember	the teacher explained it well
IR-failure				
When we have trouble understanding something in school, it is usually because	the teacher didn't explain it clearly	the teacher didn't explain it clearly	the teacher didn't explain it clearly	you didn't listen carefully
If a boy or girl tells you that are "dumb", it is more likely that they say that because	what you did really wasn't very smart	they are mad at you	they are mad at you	they are mad at you
If you find it hard to work maths problems at school, it is because	the teacher gave problems that were too hard	the teacher gave problems that were too hard	the teacher gave problems that were too hard	you didn't study well enough before you tried them
If your parents tell you you're acting silly and not thinking clearly, it is more likely to be	because of something you did	because of something you did	because of something you did	because of something you did
If you don't do as well as usual in a subject at school, this would probably happen because	you weren't as careful as usual	someone kept you from working	somebody kept you from working	kept you from working
If you can't do a puzzle, it is more likely to happen because	the instructions weren't written clearly	the instructions weren't written clearly	the instructions weren't written clearly	because you are not very good at working puzzles

Summary of Responses **by** Case Study Students to the **School Satisfaction** Subscale

Statements	Liam	Leo	Alfie	Ava	Daniel
School Satisfaction (Score)					
I like being in school	Strongly agree	Mostly agree	Mostly agree	More agree than disagree	More agree than disagree
I learn a lot at school	Strongly agree	Mostly agree	Mostly agree	Mostly agree	More agree than disagree
I feel bad at school	Strongly disagree	Strongly disagree	More disagree than agree	Mostly agree	More disagree than agree
I enjoy school activities	Mostly agree	More agree than disagree	Mostly agree	Mostly agree	More disagree than agree
I look forward to going to school	Strongly agree	More agree than disagree	Mostly agree	Mostly disagree	More agree than disagree
There are many things about school I do not like	Mostly disagree	More disagree than agree	More disagree than agree	Mostly agree	Strongly agree
School is interesting	Strongly agree	Strongly agree	Mostly agree	Mostly agree	More disagree than agree
I wish I didn’t have to go to school	Strongly disagree	More agree than disagree	Mostly disagree	More agree than disagree	Strongly agree

Appendix F: Planning Booklet

Fairy Tale Perspective Swap

Planning Booklet

Part A (plan)

1. **Select a fairy tale and identify the antagonist**

The fairy tale I have chosen is ____.

The antagonist (evil character) is ____.

2. **Describe how the audience is positioned to see the main characters.**

Are they good or evil? Do we feel sorry for them, do we dislike them, do we love them?

Character 1 (good character):

____

____

____

Character 2 (evil character):

____

____

____

Character 3:

____

____

____

Character 4:

____

____

____

Character 5:

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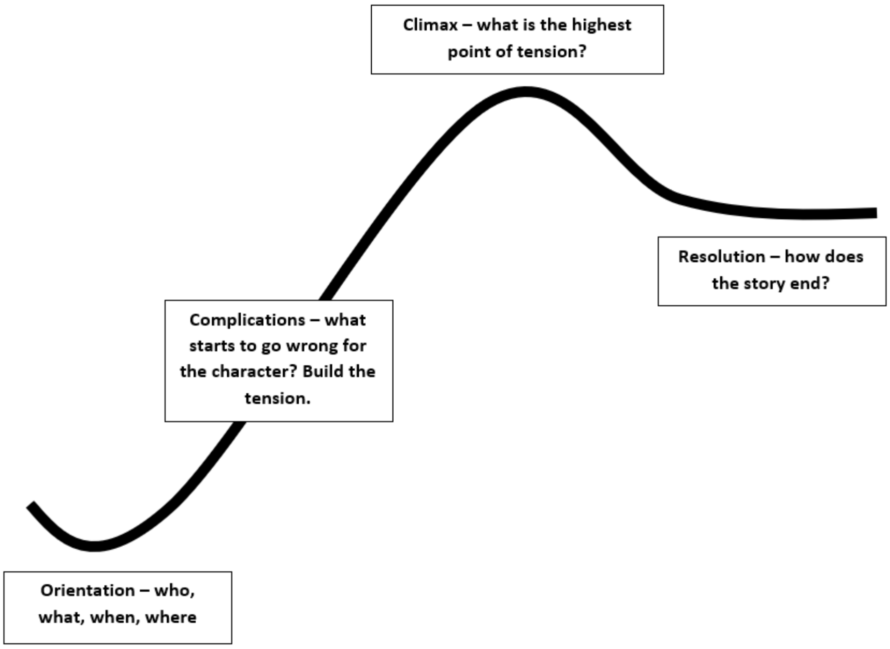
3. **Decide how you can change the story to make the audience feel sorry for the evil character.**

The audience sees my character as evil because

To show the opposite, I will need to make my audience feel that the character is

Now you need to plan your new story. Use dot points to plan the specific sections of the narrative structure.

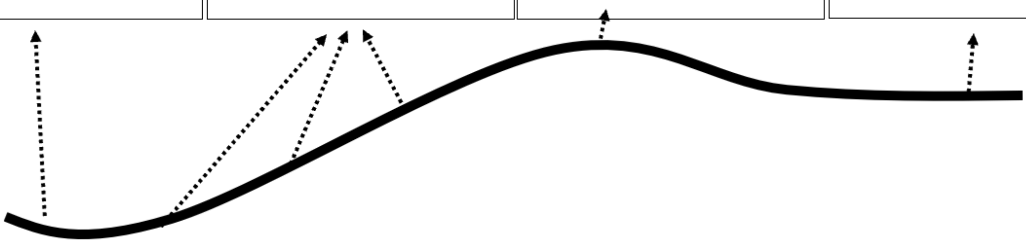


Complete the table by identifying the main negative actions your character took and 'flip' the motivations for that action to turn them from evil into good.

ACTION	NEGATIVE MOTIVATION (Original)	POSITIVE MOTIVATION (New)

4. Show your new story in the plot map below. Ensure you put in all the details of your story that are important **including the new motivations of your character**.

Orientation:	**Complications:**	**Climax:**	**Resolution:**



5. **Select a critical point in your new story that shows the alternative perspective of the evil character you have created. It needs to be a point that you could easily create your comic strip about.**

The section I have chosen to do is in the **orientation/complication/climax/resolution** (circle one).

This point includes these characters:

____

____

____.

The action in this section shows:

____

____

____

____

____.

The most important things characters/actions/landscapes I will need to be able to show are:

____

____

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