BARRIERS AND ENABLERS TO PARTICIPATION IN LEARNING AND FUTURE EMPLOYABILITY FOR STUDENTS WITH BLINDNESS AND LOW VISION IN AUSTRALIAN MAINSTREAM SECONDARY SCHOOLS: A BIOECOLOGICAL SYSTEMS PERSPECTIVE

A Thesis submitted by

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Abstract

This study explored barriers and enablers in Australian mainstream secondary schools for students with blindness and low vision. The research was undertaken at a critical time, as employment rates continued to be low for people with blindness and low vision, despite policies to increase access and participation for people with disabilities in mainstream schools and post-schooling. The study sought to explore a) what a range of stakeholders perceived enabled and/or inhibited participation in learning and future employability for secondary students with blindness and low vision, b) how these perspectives related to the Bioecological Systems Model in identifying barriers for students with blindness and low vision, and c) the implications of this knowledge for future employability and practice for educators.

The research problem was contextualised in the literature describing the impact for students with blindness and low vision on education, which were embedded in inclusive policy and practice, along with barriers and enablers within the school system, which may impact the transition to employment. While some empirical studies have investigated access to learning within school environments, many of these studies focused on the lens of one group of participants. In contrast, this thesis considered a wider viewpoint gathering holistic understanding and richer perspectives from a range of stakeholders from within the ecosystem of students with blindness and low vision in mainstream secondary schools.

Empirical data was collected through semi-structured interviews with the six students at the centre of this study and 30 other stakeholders, identified from each level of the students' ecosystem using Bronfenbrenner and Morris' (2005) Bioecological Systems Model. Participants included a) students, b) teaching staff, c) advisory teachers/therapists, d) policy-makers, e) parents/carers of students with blindness and low vision, f) people with lived experience, and g) employment consultants/employers responsible for hiring within their companies. Interview transcriptions were themed using inductive coding in NVivo, presented first for each group of participants, before being

analysed and discussed collectively, in line with Stake's (2005) *Multiple Case Study Analysis* approach.

The research makes three significant contributions to theory and practice. First, this study identified disability-specific skills as proximal processes (the interaction between person and environment) to participation in learning and future employability for students with blindness and low vision. When present over regular and sustained periods of time, disability-specific skills acted as enablers to the developmental outcomes of students with blindness and low vision. When proximal processes were dysfunctional, or were not supported within the ecosystem, it presented a barrier to future employability for students with blindness and low vision.

Second, a revisualised Bioecological Systems Model was presented and demonstrated as an holistic method to identify barriers and enablers within systems. The model offered potential applications to operationalise further research in different ecosystems. Further, evocations which relate to the improved practice in education for students with blindness and low vision, include a) empowering students to develop personal agency, b) encouraging use of mainstream technology for access and inclusion, and c) promoting a collaborative approach to learning. Finally, contributions to the prospect of employment are provided, through the development of a national scope and sequence of disability-specific skills for students with blindness and low vision.

The results of this study have international significance as they provide the potential for educators globally to prepare students with blindness and low vision to participate in learning with a strong focus on future employability.

Keywords

Education, Employability, Blindness and low vision, Disability-specific skills, Bioecological Systems Model

Thesis Certification Page

This thesis is entirely the work of Melissa June Fanshawe except where otherwise acknowledged. The work is original and has not previously been submitted for any other award, except where acknowledged.

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Abbreviations and Acronyms

Abbreviation	Meaning
ABS	Australian Bureau of Statistics
ACARA	Australian Curriculum, Assessment and Reporting Authority
AEU	Australian Education Union
AFDO	Australian Federation of Disability Organisations
AHRC	Australian Human Rights Commission
AIHW	Australian Institute of Health and Welfare
AITSL	Australian Institute for Teaching and School Leadership
AT	Advisory Teacher
ATAR	Australian Tertiary Administration Rank
BSM	Bioecological Systems Model
CAG	Council of Australian Governments
CRPD	Convention on the Rights of Persons with Disabilities
ECC	Expanded Core Curriculum
ESM	Ecological Systems Model
ICT	Information Communications Technology
IEP	Individual Education Plan
JAWS	Job Access With Speech
NAPLAN	National Assessment Program—Literacy and Numeracy
NDIS	National Disability Insurance Scheme
OECD	Organisation for Economic Co-operation and Development
PD	Professional Development
PIAFS	Pictures in a Flash
PPCT	Process-Person-Context-Time
SPEVI	South Pacific Educators in Vision Impairment
STEM	Science, Technology, Engineering, and Mathematics
TAFE	Technical and Further Education
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VET	Vocational Education and Training
WHO	World Health Organization

Glossary

Term	Definition
Advisory Teachers	Provide advice to school teams and families to support students with blindness and low vision in schools. Advisory teachers are resourced through the manager of Statewide Vision Services
Alternate format	Formats of curriculum materials or information that is provided in an alternate method such as tactile (braille), digital (e-text files), auditory (audio files) and visual (enlarged print) to enable access for people with blindness or low vision
Alternate format library	A service run by Statewide Vision Services that provides alternate formats for students with blindness and low vision throughout the State. Materials can be requested by advisory teachers or school teams
Access Technology/ Assistive Technology	Any device, system or software that enables a person access to information
Additional screen	A large monitor which is able to duplicate the screen of a device. A student with low vision can enlarge the size of the content by reducing distance between eyes and the screen, or using magnification tools
Audio description	Narration of the visual representation of images, such as on television, movies, images, diagrams and other multimedia visuals
Application (Apps)	Piece of software designed for a purpose. E.g., orientation and mobility application Moovit, explains when a bus is coming
Braille	A series of raised dots, which can be felt using the fingers, to represent a letter or word
Closed-circuit television (CCTV)	Digital magnifiers which provide magnification of printed materials or digital files.
Digital magnification	Digital magnification is used on a computer, laptop, tablet, phone or other device to increase the size of text or an image
Electronic materials	Format of text which is provided as a digital file. Examples include word, PowerPoint, excel. Also known as e-text
laptop	Small, portable computer with display, keyboard and possibly mouse. Students with blindness or low vision often will not use a mouse as they can not see where the cursor is, and will instead use the Tab key or shortcuts keys to navigate and command the program
Learning management system	Software framework which houses information within an education institution
OneNote	OneNote is a digital notebook where people can collect information, share and receive files, type and record audio
Pictures in a Flash (PIAFS)	Tactile images created on specialised paper which had a heat induced reaction to marks or lines, causing them to swell

Term	Definition
Tactile diagrams	Tactile representations of a diagram, graph or image, where information can be communicated through touch. These can be made from a variety of tactile tools, including Wikkisticks, which are knitting yarn, enhanced with no-toxic wax to increase flexibility
Screen readers	Screen readers read out the screen content to enable the listener to hear the information. Also known as text to speech
inbuilt	A function which is part of a program. Voiceover is part of Apple iPhone and iPad and will read out the text on screen
Specialised (JAWS)	A specialised product, usually made as an access or assistive technology tool, such as JAWS.
Voiceover	An inbuilt screen reader as part of Apple iPhone and iPad and will read out the text on screen
Voice activated assistants	Software which responds to spoken commands and will respond and action commands eg Google Home, Siri, and Alexa
Geographical Contexts	Setting of where a person lives or attends school
Metropolitan	A capital city
Regional	Towns and cities that are not major capital cities
Rural and remote	Any population not in an urban area.
Levels of Vision	International Classification of Diseases 11 according to World Health Organization (WHO, 2019, p. 111).
Blindness	Complete blindness with no light perception
Legally blind	Distance vision is <6/60 as measured on the Snellan chart, and/or loss of visual field to less than 20 degrees
Low vision	Equal or than ≤6/18 as measured on the Snellan chart, or loss of visual field
Functional vision	What a person can see with compensatory skills, for example a person may not be able to see a car, but they see a bright colour swoosh past in front of them, and hear an engine, and know they are near a road, so they can “see” a car in front of them
Pedagogy	The method of instruction of teaching and the beliefs that are behind the practices
Statewide Vision Services	A service which provides specialist advice and support in the area of blindness and low vision to schools throughout the State

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Chapter 1. Introduction

1.1. Introduction

The exceedingly high unemployment rate for people with blindness and low vision has been increasingly recognised as a matter of concern both within Australia and internationally (Bell & Mino, 2015; Blind Citizens Australia, 2013b, 2020; Crudden, 2012; Cullen, 2011; Koehler, 2020; McMorrow, 2018). In Australia, it was estimated that only 24% of Australian people with blindness and low vision were employed full-time (Vision Australia, 2018). This corresponded with figures in Canada and New Zealand, with 28% and 32% of people with blindness and low vision respectively, in full-time employment (Vision Australia, 2018). These figures were of particular significance as employment generated wages, provided a sense of purpose, and is supported to be the “cornerstone of social inclusion” (Blind Citizens Australia, 2013b, p. 1).

Vision is a sensory modality that allows people to learn incidentally, synthesise information, and respond to the environment (Cain & Fanshawe, 2019b). Within Australia, there were approximately 4,000 students with blindness and low vision within schools (Opie, 2018a). There are unique barriers in education that result from not being able to see (Ajuwon et al., 2015; McLinden, 2017; Reed & Curtis, 2011). Such barriers included, a) visualising written academic content, b) seeing actions of teachers as they teach, and c) movement through the physical environment within the school (Australian Human Rights Commission [AHRC], 2020). Enabling access to learning required students to be able to interact with the curriculum content, pedagogical instructions to learn, and the physical environment of the school (McLinden, Douglas et al., 2016). It has been widely argued that students with blindness and low vision required knowledge of disability-specific skills to be able to access academic content and compensate for what is incidentally gained by people with vision (Allman & Lewis, 2014; Hatlen, 1996; South Pacific Educators in Vision Impairment [SPEVI], 2016).

Explicit teaching of disability-specific skills were claimed to be required alongside the academic curriculum for students with blindness and low vision, within schools to reduce the impacts of these barriers on students' learning (Pogrund, 2019). The skills required included a) skills to access information—such as compensatory skills, assistive technology and/or braille, along with career information b) personal skills to participate—such as social skills, orientation and mobility skills and self-determination and c) skills for well-being—such as independent living, and recreation and leisure (Allman & Lewis, 2014). Douglas and Hewett (2014) asserted explicit teaching of disability-specific skills in school provides increased agency for students with blindness and low vision which, in turn, can help prepare students to more independently access education. Further research has highlighted how the explicit teaching of disability-specific skills can successfully prepare students with blindness and low vision for employment in competitive job markets (Allman & Lewis, 2014; Blackshear, 2014; Brown et al., 2013; Hatlen, 1996; Levin & Rotheram-Fuller, 2011; Lohmeier et al., 2009; Siu & Morash, 2014; Wolffe & Kelly, 2011).

Preparation for employment within schools for students with disabilities is supported internationally by legislation that mandates access to life skills to enable full and equal participation in education, the workforce and as part of the community (United Nations Educational, Scientific and Cultural Organization [UNESCO], 1994, 2006). Within Australia, the role of education in the preparation of students for future employment is also highlighted in the Australian National Curriculum (Australian Curriculum, Assessment and Reporting Authority [ACARA], 2013) and an important focus of secondary education to ensure positive life outcomes for all students (Council of Australian Governments [CAG], 2018). Preparation for employment is particularly important for students with blindness and low vision, as, upon completion of their studies, they will be competing in the same employment market as their peers, have equal requirements of their workload, and the same expectations to complete tasks. As such, this study aims to explore barriers and enablers in mainstream secondary schools, to participate in learning and prepare for future employability.

1.2. Impetus for the Study

The impetus for this study resulted from the culmination of my work as an educational leader, and trained specialist educator of students with blindness and low vision. In addition, I am a parent of a child who is legally blind and in my current role as an academic, I work and research alongside policy-makers, who are responsible for making decisions about education provision for students with blindness and low vision. These many roles have provided me with different views of the same story related to enabling students with blindness and low vision access alongside their peers.

With inclusion of all students in education and focus on employability as the goal in all schools globally (United Nations Educational, Scientific and Cultural Organisation [UNESCO], 1994) it is important that students with blindness and low vision are provided ways to access and interact with learning (Cain & Fanshawe, 2020). This may require teachers to make modifications to content and pedagogy and explicit teaching of disability-specific skills, to support students to independently access information (McLinden, Douglas et al., 2016).

With a focus on resolving how to increase the future employment for students with blindness and low vision from 24% (Vision Australia, 2018), this study aims to understand barriers and enablers to access learning within mainstream secondary schools for students with blindness and low vision (Koehler, 2020). It explores how these aspects may impact future education and employment. To do so, this research shares the perspectives of multiple stakeholders within the ecosystem who directly and indirectly influence the education of students with blindness and low vision.

While limited studies have addressed a) disability-specific skills required for students with blindness and low vision, b) inclusion in education systems of students with blindness and low vision, and c) employment of people with blindness and low vision, this study focuses on the intersection between all three. It fills a gap in the current body of literature by exploring the barriers and enablers that are in mainstream schools for students with blindness and low vision to access learning, and prepare the necessary skills for future employment. Consequently, this study aims to use a bioecological lens to consider multiple stakeholder perspectives within the ecosystem for blind and low vision students. Approaching the research in this way will allow an in-depth investigation into how students with blindness and low vision can be successfully prepared for the future.

1.3. Research Problem

Despite changing attitudes towards disability, development of assistive technology and international legislature to include people with disability in education and employment, employment rates for people with blindness and low vision remains at very low levels worldwide (Blind Citizens Australia, 2020; Vision Australia, 2021a; Vision Australia, 2018). One of the roles of schools, in particular secondary schools, is to prepare all students for the transition to employment and/or higher education post-schooling (Queensland Government, 2021c). Policies within Australia advocated equitable access for students with disabilities during the transition from secondary to post-school education or employment (Disability Discrimination Act, 1992, *Disability Standards in Education*, 2005). However, due to the visual nature of the curriculum, students with blindness and low vision do not always have access to the curriculum to participate in learning (Cain & Fanshawe, 2020; McLinden, Douglas et al., 2016; Siu & Morash, 2014).

Given the strong links evidenced between Year 12 attainment and employment (Australian Bureau of Statistics [ABS], 2013) it is important to ensure all students have equitable access to learning, to prepare for future employment. An Australian report titled *Disability Rights Now 2019* (Australian Civil Society CRPD Shadow Report Working Group, 2019) revealed that only 36% of people with disabilities complete secondary education, as opposed to 60% of people without disabilities. The Australian Federation of Disability Organisations (2013) similarly reported “significant, deep-seated problems beset the education of children with disabilities across every educational sector from pre-school to post-school, in the government, independent and catholic education systems, in every state and territory" (p. 3). Therefore, this study was timely as it aimed to investigate both the barriers and enablers are for blind and low vision secondary students in relation to schooling and post-schooling success.

Students with blindness and low vision require participation in education to prepare for employment. Specifically, this included access to learning through knowledge and use of disability-specific tools such as: assistive technology to access content, canes to negotiate the environment, and scaffolded social learning experiences, which could assist students to compensate for lack of vision (Cain & Fanshawe, 2019c). As students enter secondary, McLinden, Douglas et al., (2016) noted the importance of learning to access the education environment independently; that is to develop the knowledge and skills to problem solve, think critically to access required information which "increases independence" (McLinden, Douglas et al., 2016, p. 184). This meant that a growing focus was on providing disability-specific skills to ensure students were prepared for the independent access required in employment. While some research existed, that identified positive outcomes on inclusion in education for students with blindness and low vision we still do not know how this impacts on their prospective employability. This study therefore aims to fill the gap in the current knowledge of how mainstream education prepares students with blindness and low vision for future employment.

1.4. Research Aims

This research aimed to investigate what various stakeholders perceived to be barriers and/or enablers to learning for students with blindness and low vision. More specifically, it aimed to know what best supported, or constrained students with access to knowledge and skills related to the Australian senior school curriculum in order to successfully prepare them for transition to the workforce.

Consequently, this study aimed to:

1. Gather information about experiences in education for students with blindness and low vision in secondary schools
2. Understand the perspectives of other stakeholders within the ecosystem of students with blindness or low vision (parents, teachers, advisory teachers, experts, people with lived experience of blindness and low vision, and employers), and
3. Consider the implications of these perspectives for future employment of students with blindness and low vision.

To understand the low employment rate that existed for students with blindness and low vision, it was critical to gain the voice of all stakeholders in addressing gaps evident in the scholarly literature. Few studies have used student voice to discuss the barriers to inclusion in secondary specifically (Jessup, Bundy, Broom & Hancock, 2018; M. Thurston, 2014; Whitburn, 2014a), however, it was important to hear a range of voices from the ecosystem, so this study was conducted.

This thesis aims to make a number of contributions to the field of education including:

a) a revisualised Bioecological Systems Model - proposed to examine the ecosystem of individual students or groups of students on a caseload,
b) several evocations related to improved practice, and
c) contributions to the prospect of employment through the accreditation of a national scope and sequence of disability-specific skills for students with blindness and low vision

It is hoped that the findings from this study may be transferable to other identified groups of students with disabilities such as students who are deaf, or hard of hearing, or students with dyslexia and/or autism.

1.5. Research Questions

Guided by a focus on improving employability and independence for students with blindness and low vision, the research questions included:

- What do a range of stakeholders perceive enables and/or inhibits access for students with blindness and low vision, in relation to participation in learning and future employability?
- How do the findings from these perspectives relate to the Bioecological Systems Model in identifying barriers for students with blindness and low vision? and
- What are the implications of this knowledge, for future employability and practice, for educators?

1.6. Research Significance

This study aimed to understand barriers and/or enablers to participation in learning and future employability for students with blindness and low vision in mainstream secondary schools. It explored direct links between access to learning and future employment opportunities. The study was important, as despite promoting the benefits of diversity in hiring people with disabilities and increased accessibility through technological advances for people who were blind or had low vision, unemployment figures remained alarmingly high for people with blindness and low vision (Blind Citizens Australia, 2020; Vision Australia, 2018). Given multiple policies and views on equal access for people with disabilities this was highly concerning.

Article 24 of the United Nations *Convention on the Rights of Persons with Disabilities* imparted that people with disabilities needed access to life skills that would enable them to participate fully and equally in education, the workforce, and as part of the community (United Nations, 2006). A solution to supporting blind and low vision students offered in the research literature was to explicitly teach disability-specific skills that assist in accessing the learning environment. This included skills such as compensatory access, for example, braille, or assistive technologies to access materials, and orientation and mobility skills to navigate the environment (Allman & Lewis, 2014). Further studies proposed that people with blindness or low vision who had been explicitly taught disability-specific specialist skills were significantly more likely to be in paid employment post-schooling (Sapp & Hatlen, 2010; Wolffe & Kelly, 2011). Despite these findings in the literature, as yet, there was no formal recognition or statutory mandate to implement disability-specific skills in education. There was also little research which involved how disability-specific skills were being explicitly taught in mainstream secondary schools to best support these students in achieving their work and further learning goals post-schooling (Pogrund, 2019). It is hoped that findings from this study will improve outcomes for blind and low vision students in relation to employability and more practically, create a scope and sequence for nationally accredited resources based on disability-specific skills for students with blindness and low vision in secondary schools to prepare for the transition to employment.

Additionally, this study used the Bioecological Systems Model (Bronfenbrenner & Morris, 2005) to analyse multiple stakeholder perspectives. Interviews were conducted to determine barriers and enablers to accessing the curriculum for secondary students with blindness and low vision in mainstream schools. It was significant to hear the voice of multiple stakeholders as it would enable an holistic understanding of the ecosystem of students with blindness and low vision, to form recommendations for future practice.

1.7. Approach to Conducting the Research

In order to answer the research questions, a qualitative case approach (Stake, 2005) was designed, using semi-structured interviews (36) to gain an understanding of the perspectives of stakeholders within the ecosystem of students with blindness and low vision in mainstream secondary schools. The Bioecological Systems Model (Bronfenbrenner & Morris, 2005) was used to identify important stakeholders in the students' ecosystems as well as evaluate their perspectives of the experiences of students with blindness and low vision. The research design used Stake's (2005) *Multiple Case Study Analysis* approach, interview transcriptions from each case study, or group of stakeholders, were uploaded into NVivo and the references were coded. The themes were further analysed for each group of participants within a case study, and presented as findings, prior to a discussion about these collective views.

1.8. Chapter Summary

Chapter 1 introduced the research problem under investigation for this study to gain an understanding of the barriers and enablers to participation in learning and future employability for students with blindness and low vision in mainstream secondary schools. The impetus for the study and the importance of preparation for future employability within secondary schools was also shared in this chapter. The research aims, questions, and significance were outlined and the approach to conducting the research was introduced. Chapter 2 examines the literature. An historical context of inclusive practices in schools is presented, along with known barriers and enablers to success in mainstream schools. This is followed by an understanding of the transition to employment for people with blindness and low vision. It also identifies a gap in knowledge regarding how students with blindness and low vision participate in learning in secondary schools to prepare for future employment.

Chapter 3 outlines the theoretical framework that underpins the thesis, including the use of the Bioecological Systems Model (Bronfenbrenner & Morris, 2005) and the significance of the wider ecosystems for considering the impacts on an individual. The methodology is explained in Chapter 4. This qualitative study focuses on case studies, using interviews to examine the perspectives of the different stakeholders within the ecosystems. It discusses the methods used to conduct the research and how the procedures used ensured the research questions were addressed to reduce researcher bias and ensure validity.

After prioritising the voice of students with blindness and low vision in Chapter 5, data findings of stakeholders are presented in case study groups in Chapters 6 and 7. Following Stake's (2005) *Multiple Case Study Analysis*, the data findings will then be discussed collectively in Chapter 8. Chapter 9 concludes the thesis, summarising the findings and outlining recommendations for the future.

Chapter 2. Literature Review

2.1. Introduction

With a focus on the low unemployment rates of people with blindness and low vision in Australia (Vision Australia, 2018), this study aimed to gain an holistic understanding of how students were accessing the knowledge and skills in secondary schools required for future employability. The research design used the Bioecological Systems Model (Bronfenbrenner & Morris, 2005) to examine barriers and enablers to participation in learning and future employability in mainstream secondary schools. The results from this study would provide recommendations to educators, which may increase future employability of students with blindness and low vision for future generations.

Chapter 1 outlined the impetus and significance of this study to identify barriers and enablers to accessing the curriculum for students with blindness and low vision in mainstream secondary schools. This chapter reviews the literature to gain a deeper understanding of:

a) blindness and low vision, and how it impacts a person's development and access to education,
b) education of students with blindness and low vision, through a history of educational practices of students with blindness and low vision,
c) preparation for the transition to employment, gaining an understanding of the future employability skills being acquired in secondary schools.

At the intersection of this literature, there was a gap in knowledge regarding specifically how students with blindness and low vision participate in learning to prepare for future employment. It is this nexus, which is aimed to be uncovered throughout this study.

2.2. Key Terms

Several key terms are referred to throughout the literature review and discussion, which are defined in this section.

2.2.1. Blindness and Low Vision

World Health Organization [WHO] (2019) defined blindness and low vision as damage or disease to the eye or visual system, which can not be corrected with glasses or surgery. The impairment to the eye can be categorised as blindness (no light perception), legal blindness (a severe vision impairment), and low vision (a mild or moderate vision impairment) (Queensland Government, 2016b). Blindness and low vision impact a person’s function as they can not see visual information within the environment (WHO, 2019).

2.2.2. Mainstream Secondary Schools

Mainstream schooling is “the general education system, that receives students with special education needs” (Folostina & Iacob, 2020, p. 21). According to the Queensland Government in Australia “secondary schools, or high schools, provide educational programs for students from Year 7 to Year 12. Students are offered a broad range of academic and vocational subjects enabling them to pursue a course of study that will further their educational and career goals” (Queensland Government, 2021d, para 1). Secondary schools in Australia can be Government funded (State schools) or privately funded (Catholic and Independent schools). According to Australian Institute of Health and Welfare (AIHW, 2020), 89% of students with disabilities attended mainstream secondary schools.

2.2.3. Inclusive Education

Many jurisdictions present inclusive education practices as those where “students could access and fully participate in learning, alongside their similar-aged peers, supported by reasonable adjustments and teaching strategies tailored to meet their individual needs” (Queensland Government, 2021b, p. 1). According to the 2005 *Disability Standards for Education* amendment to the *Disability Discrimination Act 1992* (Section 2.2.3), “a person with a disability is able to participate in courses or programs provided by an educational institution, and use the facilities and services provided by it, *on the same basis* as a student without a disability if the person has opportunities and choices in the courses or programs and in the use of the facilities and services that are comparable with those offered to other students without disabilities.”. The intent is that all students can participate in all elements of the learning, however some may require modifications to enable access to the curriculum.

2.2.4. Modifications

Under the 2005 *Disability Standards for Education* amendment to the *Disability Discrimination Act 1992*, all schools are required to make reasonable adjustments for students with disability to enable them to access and participate in education on the same basis as students without disability” (Queensland Government, 2021a, para. 5,). Such reasonable adjustments can be called modifications. The terms modifications, adjustments and accommodations can be used interchangeably to describe modified materials that students use to access the curriculum and instructional tasks (Strogilos et al., 2020). As students with blindness and low vision demonstrated diverse needs, students required different modifications to access the curriculum. These included a combination of modifications to enable access at the same level as their peers, such as:

- visual modifications (changes to font size or contrast and magnification),
- auditory modifications (text-to-speech software, image descriptions),
- tactile modifications (braille, tactile diagrams, 3D printed materials),

- digital modifications: (provision of materials in electronic format to enable independent access to make modifications using technology), and
- environmental modifications: (changes to position in classroom or school environment) (Cain & Fanshawe, 2019b).

2.2.5. Disability-Specific Skills

Disability-specific skills enabled students to make modifications to their own access, where possible. Disability-specific skills, also known as the expanded core curriculum, referred to the "knowledge and skills that are needed by students with visual impairments due to their unique disability-specific needs. Students with visual impairments need the expanded core curriculum in addition to the core academic curriculum of general education" (Willings, 2019). It is proposed that "in addition to the general (core) curriculum, provision of the Expanded Core Curriculum will maximise the academic, social, vocational and life skills of learners with vision impairment" (SPEVI, 2016). The disability-specific skills include:

- skills to access information (compensatory skills, assistive technology and/or braille, along with career information),
- personal skills to participate (social skills, orientation and mobility skills and self-determination, and
- skills for well-being (independent living, recreation and leisure (Allman & Lewis, 2014).

Explicit teaching of disability-specific skills to students with blindness and low vision are believed to increase agency in learning (Douglas & Hewett, 2014; McLinden et al., 2020).

2.2.6. Future Employability

Employability is generally understood as a component of the broader knowledge, skills, and aptitudes individuals possess and how they use those assets to get and keep jobs (Tyson, 2020, p. 7). Using the term future employability refers to “young adults who have not completed their formal education, but who are preparing for their future and are making decisions based on these perceptions of the future” (Gunawan et al., 2021, p. 103). A focus on post-school education and work, was an important goal of the Advancing Education Action Plan (Queensland Government, 2016a). Preparation of students for their post-secondary transition was important for the student, as an “optimistic perception of one’s future employability is critical for young people, being linked to motivation, behaviours, and well-being” (Gunawan et al., 2021, p. 101).

2.3. The Impact of Blindness and Low Vision

Blindness and low vision have a profound impact on students’ development and access to education and employment. Blindness and low vision are usually classified by a person’s distance vision or visual field (WHO, 2019). Blindness and low vision are diagnosed if the impairment “can not be corrected to within normal limits” (Department of Education, 2020, p. 28). A diagnosis is generally made by an ophthalmologist, by measurement of a person’s distance vision on the Snellan Eye Chart (Sue, 2007). A person with 6/6 distance visual acuity has standard vision. The top number indicates how far the person being tested can see, and the bottom number measures it against standard vision (Sue, 2007). Therefore, a larger number on the bottom indicates more significant impairment.

Within the state of Queensland, the terms blindness (no light perception), legal blindness (a severe vision impairment), and low vision (a mild or moderate vision impairment) are used to describe the severity of vision impairment (Queensland Government, 2016b). Blindness and low vision are categorised as:

- Blindness means the eyes have no useable vision. Students may have light perception or see shadows, but they can not use vision to view information or navigate the environment.
- Legal blindness refers to a severe vision impairment in which a person has a visual acuity of less than 6/60. A person could

also have blindness and low vision if their visual field is less than 20 degrees, or near vision is worse than N6 (size of font),

- Low vision refers to a mild to moderate vision impairment (≤6/12 to 6/60). A person can also have low vision if they have reduced visual fields or cortical vision impairment when the brain does not interpret the meaning of images sent from the visual system (Queensland Government, 2016b).

Recently more importance is being placed on how blindness and low vision impacts a student in the educational context, as opposed to the medical diagnosis. Concerns have been raised about defining blindness and low vision through an eye assessment "where a child's eligibility is often gauged from their visual performance in a clinical environment, a setting that is far removed from the child's real-world" (Silveira & Cantle Moore, 2018, p. 110). Instead, functional vision, or how a person uses their remaining vision, memory, other senses, and prior knowledge to access their environment was considered to be valuable to determine the impact of the impairment (Silveira & Cantle Moore, 2018). Functional vision is based on the "perception of disability as a sociocultural developmental phenomenon" (Gindis, 2003, p. 202). In this premise, the disability is the impact of blindness or low vision encased by the culture, norms, and expectations of the person's society (Dawn, 2015). Therefore, how students are disabled by their impairment was defined by their performance of defined roles and tasks (Dawn, 2015). In mainstream classes, the impact of disability is reflected in the extent to which a person with blindness or low vision could access the curriculum and participate in learning.

The change to functional impact of blindness and low vision, as opposed to the medical model of disability, has been reflected in policy for access to vision support services in Queensland schools (Department of Education, 2020). To be eligible for vision support services, students must be formally diagnosed with "visual acuity of ≤6/18, according to the Snellen Chart, best corrected and/or a visual field loss, or significant fluctuating vision" (Department of Education, 2020, p. 27). However, a second criterion has been added to consider the impact of functional vision on education. This involved "documented evidence of significant educational impact (activity limitations or participation restrictions) resulting from the vision impairment in one or more of the following focus areas: curriculum, disability specific curriculum and/or learning environment" (Department of Education, 2020, p. 27). This second criterion recognised the importance of the students' functioning within the school environment.

2.3.1. Prevalence of Blindness and Low Vision

Blindness and low vision are considered a "low incidence disability" (Holbrook, 2015, p. 159). Blindness or low vision can be congenital (present from birth) or acquired (from accident or disease) (WHO, 2018). Globally, it was estimated that at least 2.2 million people had a vision impairment, approximately one-half of which could have been corrected with surgery, or prevented from disease (WHO, 2019). For children and young people, an estimated 14 million worldwide were blind or had low vision (Solebo et al., 2017). Blindness and low vision are more prevalent in low and middle-income countries and rural communities with decreased maternal and neonatal health care (Solebo et al., 2017).

Data from the ABS (2018) *National Health Survey* revealed that approximately 131,000 people in Australia reported having blindness or low vision. Of this, 93% occurrences were in people aged 65 or over, indicating a higher prevalence of acquired vision loss due to age-related factors (AIHW, 2021). Aboriginal and Torres Strait Islander people also were reported to have slightly higher rates of vision impairments per population, which resulted from uncorrected refractive error and cataracts (AIHW, 2020; Foreman et al., 2017).

It was difficult to ascertain an exact number of students with blindness and low vision in Australian schools. An Australian Childhood Vision Impaired Register exists, although registration is not compulsory, and less than 1,000 students were registered (Silveira et al., 2021). Opie (2018a) estimated that there were approximately 4,000 students with blindness and low vision in

Australian schools. Vision Australia (2019) had 3383 children and young people aged zero to 25 registered for services, however, the exact number of students who receive services in Queensland is unknown (Fanshawe et al., 2021).

It is hypothesised that the fluctuating numbers might be explained by the different eligibility criteria for students to access support services across the states and territories of Australia. For example, students with a moderate vision loss at 6/18 were eligible for services in Queensland, Western Australia, Northern Territory, Victoria and South Australia (primary) (Fanshawe et al., 2021), however that measure was 6/24 in New South Wales and Australian Capital Territory and 6/48 in Tasmania (Fanshawe et al., 2021). To access services for secondary students in South Australia, a student must be legally blind with a Snellan reading of 6/60 (Fanshawe et al., 2021). Blindness and low vision is a low incidence disability, and as such, specialised services are provided to assist classroom teachers to support inclusion in education (Queensland Government, 2016b).

2.3.2. Causes of Blindness and Low Vision

In low-income countries, the most likely cause of blindness and low vision in adults were untreated refractive errors, glaucoma, corneal opacities (such as cataracts), and health conditions such as diabetes (WHO, 2019). Blindness or low vision from acquired vision loss was also caused by trachoma, the leading cause of vision impairment by infection, which was still prevalent in 44 countries, including Australia (WHO, 2019). In middle, to high-income countries, age-related conditions included macular degeneration, diabetic retinopathy, corneal opacity, and glaucoma (Flaxman et al., 2017).

For children and young people in low-income countries, uncorrected refracted errors and vision loss resulting from lack of nutrition and disease were the most common form of blindness and low vision (WHO, 2019). In middle and high-income countries, the most common causes were congenital genetic anomalies, cerebral/cortical vision impairment (difficulties in transmitting information from visual structures to the brain), and optic nerve hypoplasia

(Solebo et al., 2017). The Australian Childhood Visual Impairment Register (Silveira et al., 2021) reported moderate vision impairment was the most prevalent for Australian children, with 10% of students recorded as totally blind. The register also identified the most common diagnosis for children was retinal dystrophy, cortical vision impairment and albinism (Silveira et al., 2021). Nystagmus was reported in a third of the children on the register, and 44% had additional disabilities (Silveira et al., 2021). The literature identified a diverse and heterogeneous range of conditions that could impact students' ability to access the curriculum though vision in Australian secondary classrooms.

2.3.3. Functional Impact of Blindness and Low Vision

According to the World Report on Vision (WHO, 2019), vision had a profound impact on a person because "in a world built on the ability to see, vision, the most dominant of our senses, is vital at every turn of our lives" (p. v). Swenor et al. (2020) reported that blindness and low vision had significant consequences on the person, and their families. For adults, implications of blindness and low vision for a person were noted in mobility, with people being slower to navigate through spaces and requiring mobility aides (Swenor et al., 2013). Earlier studies have also linked blindness and low vision to reduced psychosocial functioning and Quality of Life [QoL] (Foreman et al., 2017). Anxiety and depression were also found to be prevalent for people with blindness and low vision (Bhuvaneswari et al., 2016).

Furthermore, Bassey and Ellison (2020) found blindness and low vision impacted social interactions, due to reduced friendship groups and romantic partners, negative workplace interactions and an increased need for informal support from families. The increased cost of disability was noted by Köberlein et al. (2013), who reported that medical costs of healthcare and assistive devices were increased for a person with blindness and low vision. For people who have experienced congenital or early onset blindness, lack of vision can cause developmental delays to cognitive, emotional, social and physical development, which can additionally impact education (Datta & Talukdar, 2016; WHO, 2019).

Within schools, students with blindness and low vision faced unique challenges as vision is the sense that allows students to learn incidentally, synthesise information, and respond to the environment (Ajuwon et al., 2015; McLinden, 2017; Reed & Curtis, 2011). Ajuwon et al. (2016) found that the student's level of visual acuity, prior exposure to early intervention, and presence of additional disabilities impacted functional vision within the school environment. Thurston et al. (2010) found additional individual characteristics which were believed to impact access to learning, which included the age of onset of the vision loss and psychosocial implications as a student adjusted to their vision loss. Without vision, students were unable to see incidental information in the school environment, which could provide barriers to accessing the curriculum, social interactions, and movement through the school, which is important to consider for all students with disabilities (Lohmeier, 2009; Lohmeier et al., 2009; Sutherland & Gosteva, 2019). The ability of a student to access information independently, was important to ensure they were able to function at the same level of their peers within the school (McLinden, Douglas et al., 2016; Opie, 2018a).

In Vygotsky's (1993) collected works, *Defect and Compensation*, students with disabilities were viewed as having an ability to compensate for their disabilities. For students with blindness and low vision, this meant that if students could use additional tools to access information, using compensatory skills, assistive technology and/or braille they may be able to compensate for their vision loss (Allman & Lewis, 2014). McLinden, Douglas et al., (2016) suggested that the digital age has opened up opportunities for students with blindness and low vision to gain greater access and active participation in learning through technology.

Social inclusion in the school environment was considered as another impact of blindness and low vision. Sapp and Hatlen (2010) contended that successful inclusion in mainstream schools, goes beyond passing courses and academic content and is based on feelings of connection through social inclusion. For students with blindness and low vision this could be problematic due to the reduced visual information which can impact social interactions (Jessup, Bundy, Hancock & Broom, 2018). Earlier studies found that students with blindness and low vision lacked understanding of social skills and etiquette, making it difficult to interact with their peers (Doepel, 2013; Zebehazy & Smith, 2011). Decreased social interactions were problematic as “rejection and isolation…can result in poor long-term psychological outcomes” (Jessup, Bundy, Hancock et al., 2018, pp. 35–36). Therefore, for students to function in the school environment, at the same level as their peers, it was important that students interact positively with others and develop feelings of inclusion (Kozulin & Gindis, 2007; M. Thurston, 2014).

Orientation and mobility through the school environment was another functional impact of blindness and low vision. Moving around the school required a conceptual understanding of spatial and environmental awareness, mapping the environment, and an awareness of safety (Szabo & Panikkar, 2017). Students without good orientation and mobility techniques have been found to be slower around the environment and required more assistance by others, which reduced independence (Blake, 2021). Opie (2018b) found that the use of mainstream technology to access orientation and mobility, through the use of Google Maps and journey planners, increased agency in navigating the environment, which decreased the impact of disability. Therefore, orientation and mobility skills were important for students’ access to the school environment (Blake, 2021; Sutherland & Gosteva, 2019).

This section outlined the prevalence and causes of blindness and low vision for adults and children globally and within Australia. The functional impact of blindness and low vision on education was impacted by factors such as a student’s individual characteristics, ability to access information, interact with others socially and navigate throughout the school.

2.4. Education of Students With Blindness and Low Vision

Although students with blindness and low vision are educated in mainstream schools with their peers, this has not always been the practice (Folostina & Iacob, 2020). This section explores the education for students with blindness and low vision to understand the historical context and current practices.

2.4.1. History of Education of Students With Blindness and Low Vision

Historically, students with blindness and low vision were educated in special schools focusing on disability-specific skills content and skills, particularly life skills, orientation and mobility, and braille (Schifter, 2015). Research by Opie (2018a) evidenced that education in a special school was particularly frustrating for many adults with blindness and low vision. It was reported they were treated as though they had an intellectual impairment, rather than a visual disability (Opie, 2018a). In 1994 UNESCO released an international consensus, the *Salamanca Statement*, which promoted inclusive education to support learning for all students and support their individual needs in learning (UNESCO, 1994). The statement changed the scope of school placement for students with blindness and low vision to mainstream schools and changes in standards and laws. Specifically in Australia, the 2005 *Disability Standards for Education* amendment to the *Disability Discrimination Act 1992* stipulated that "educational institutions are lawfully obliged to consider the needs of students with disabilities" (Vision Australia, 2015, p. 1).

Following the ratification of the United Nations (2006) *Convention of the Rights of Persons with Disabilities* by more than 70 countries, including Australia, it became law to provide "education that ensures the right to education of people with disabilities at all levels, aiming to eliminate barriers that exclude or marginalise" (Opie, 2018a, p. 76). According to Article 24 (p. 3), this included "facilitating the learning of braille, alternate script, augmentative and alternative modes, means and formats of communication and orientation and mobility skills" in addition to "measures taken to employ teachers…who are qualified in braille, and to train professionals and staff who work at all levels of education" (United Nations, 2006, p. 3). This legislation led to the inclusion of students with disabilities in Australia into their local mainstream schools (Forlin et al., 2013).

For students with blindness and low vision, some schools still exist which have special education units or classes, with the dedicated resources and expertise to implement disability-specific skills (cf South Australian School for the Blind). However, in 2020, 89% of students with a disability attended mainstream secondary schools (AIHW, 2020). Siu and Morash (2014) asserted that educating students with blindness and low vision in mainstream schools presented challenges for schools and the student as they were likely to be the only person with blindness or low vision in the school.

Australian schools utilise a National Curriculum, which was designed to ensure academically rigorous expectations across all Australian schools in line with International educational standards (ACARA, 2010). It acknowledged "that many students with disability are able to achieve educational standards commensurate with their peers, as long as the necessary adjustments are made to the way in which they are taught and to the means through which they demonstrate their learning" (ACARA, 2013, p. 1). However, due to the visual nature of the National Curriculum, there has been debate since its introduction over the suitability of access to visual content within the learning areas and cross-curriculum priorities for students with blindness and low vision (Blind Citizens Australia, 2013a).

2.4.2. Inclusion for Students With Disabilities

Definitions of inclusion were generally categorised into two schools of thought. Policies looking for key features of inclusion such as, "the active participation of every child as a full member of his or her family, community, and society" (Cologon, 2013, p. 8). Alternatively, "conceptualising inclusive education as the removal of that which excludes and marginalises" (Forlin et al., 2013, p. 7). After examining the inclusive practices of Education

Departments on their websites, many education sectors named groups of students they sought to include. According to Devine et al. (2008), this named and normalised these students as the “other” (p. 369). Norwich (2009) argued that identification of students with disabilities created a “dilemma of difference” (Norwich, 2009, p. 447) as although identification provided students with eligibility to receive accommodations, it could also lead to stigma or lowered expectations for identified students (Norwich, 2009).

Within a socially just society, such as Australia, the opportunity to access and participate in education is considered a legal right to appropriate instruction (Bishop & Rhind, 2011; SPEVI, 2016). Furthermore, Cologon (2013) argued that the inclusion of students with disabilities in schools was important as it developed social awareness, acceptance and a culture of inclusion modelled to the entire school community. However, despite policies promoting inclusion by schools throughout Australia, many authors attested to the gap between policy and practice (Byrne, 2014; Forlin et al., 2013; A. Thurston, 2014) and the inequities in inclusive practices across schools (Brown et al., 2011; Jessup, Bundy, Broom et al., 2018).

2.4.3. Policy Versus Practice for Students with Disabilities

The disparity between schools and education providers in proving inclusive practices for students with disabilities has been recognised as a concern by the Australian Human Rights Commission (AHRC, 2020). Australian education goals, expressed in the *Alice Springs (Mparntwe) Education Declaration* (Education Council, 2019), rest on excellence and equity, which intended to provide equitable access for *all* students, with an intention to create confident and knowledgeable members of the community. However, the AHRC (2020) acknowledged that exclusion of students with disabilities occurred in schools, through direct or indirect discrimination, for a number of reasons. These included a lack of knowledge by educators of the needs of students with disabilities and a lack of collaboration with families and external services (AHRC, 2020). Other disparities in access to education for students with blindness and low vision were reported in geographic locations, with rural and remote areas reported to not receive the same services for students (Beamish et al., 2020). Bonnor et al. (2021) argued that inequalities in services also existed between government and private school sectors. This was problematic for students with blindness and low vision who were seeking equitable access to the Australian Curriculum.

Allocation of resources appeared to be a further disconnect in the provision of education for students with disabilities. In Australia, the Federal Government provides a small fraction of investment into education, leaving State Governments primarily responsible for education budgets (Australian Education Amendment Act 2017, Cth). Funding for students with disabilities was dispersed to schools on a needs-based formula to enable resource decisions to be made in the local context, to make adequate modifications for all students to access the curriculum (Gallagher & Spina, 2021). This funding model intends for schools to move towards full participation of all students in an inclusive environment. It is expected that features of universal design would be in place, rendering individual modifications as less necessary (Deloitte Access Economics, 2017). However, the latest Gonski report (Bonnor et al., 2021) described the funding model as disproportionate throughout States and Territories, public and private schools, and for students with disabilities.

School-based funding was deemed problematic by Dickson (2019), who questioned the knowledge and training of school leaders to make decisions about resourcing for students with disabilities. Funding inadequacies were highlighted in *The State of Our Schools Survey* (Australian Education Union, 2020), which found that 87% of 787 government school principals that responded needed to reallocate funds within the school budget to meet the needs of students with disabilities. Despite this additional distribution of funding, 43% of more than 9,000 teachers that participated, reported that students with disabilities were not having their needs met within the school context (Australian Education Union, 2020). Similarly, an Australian Senate enquiry into students with disabilities, showed systemic inequities existed in the education of students with disabilities within Australia, and called for a national approach to increasing access to education for students with disabilities (Commonwealth of Australia, 2016). These findings were echoed in a *Review of Education for Students with Disability in Queensland State Schools* which identified the need for alternate resourcing models for Queensland schools (Deloitte Access Economics, 2017).

Workforce capability was also identified as inequitable between schools within Queensland and Australia (Commonwealth of Australia, 2016; Deloitte Access Economics, 2017). While the review into Queensland schools identified a positive commitment by many educators to include students with disabilities within schools, it identified educators reported ambiguity as to how inclusion could be achieved in practice (Deloitte Access Economics, 2017). The report's recommendations suggested that Australian policy needed revision to ensure greater awareness of the mandatory requirements of educators to foster inclusive practices for students with disabilities within schools (Deloitte Access Economics, 2017). This is evidenced in Recommendation 5.4:

> [T]he Department can build workforce capacity by clearly signalling and communicating clear messages to the workforce and wider education community regarding the capabilities that it wants in the classroom: explicit hiring structures which outline inclusive education practice, ongoing professional development and access to just-in-time training. (Deloitte Access Economics, 2017, p. 147)

This recommendation highlighted that teachers themselves needed support and knowledge, to provide adjustments for students with blindness and low vision.

The report suggested that inclusion was best achieved through increased collaboration with all stakeholders, specifically parents, carers, and external experts (Deloitte Access Economics, 2017). Recommendation 5.6 outlined "school leaders have a role to play in aiding their school to become a learning community, by fostering a culture of collaboration and collective responsibility" (Deloitte Access Economics, 2017, p. 122). Parents and carers were recognised to hold specific knowledge of their child's abilities (Bonnor et al., 2021; Deloitte Access Economics, 2017; Education Council, 2019). External teaching support mechanisms such as advisory teachers and therapists were recommended to assist teachers in providing tailored curriculum modifications for students with disabilities (Deloitte Access Economics, 2017). Thus recognising the complex ecosystem for students with blindness and low vision in Australian mainstream secondary schools.

Shortly after the Senate enquiry, the *National School Reform Agreement* (CAG, 2018), a joint agreement throughout Australian States and Territories, was developed. The reform aimed to a) remove inequalities in education and b) increase participation and retention through a focus on post-school transition outcomes (CAG, 2018). These recommendations identified the disparities throughout different schools with the intention of bringing policy and practice to support students with disabilities in schools. Findings from the literature identify there are still barriers to inclusion in mainstream schools for students with blindness and low vision.

2.4.4. Barriers and Enablers in Education for Students With Blindness and Low Vision

Scholarly research has shown that students with blindness and low vision can face significant challenges in schools. However, it has also identified that students have found ways to overcome these barriers to access learning in Australian mainstream schools (Brown & Beamish, 2012; Cain & Fanshawe, 2020; Doepel, 2013; Jessup et al., 2017; Jessup, Bundy, Broom et al., 2018; Jessup, Bundy, Hancock et al., 2018; Opie, 2018a, 2018b; Opie & Southcott, 2015; Whitburn, 2014a, 2014b, 2014c). For many of these studies, barriers and enablers were identified which potentially influenced access to education for students with blindness and low vision. The importance of access can not be understated as, without participation in learning, students may experience fewer learning outcomes than their peers. Therefore, when students with blindness and low vision can participate in learning, at the same level as their peers they are afforded inclusion (Cologon, 2013). The following were identified in the literature as impacting access to participation in learning for students with blindness and low vision, including a) professional knowledge to support students with blindness and low vision and b) implementation of the disability-specific skills to support inclusion.

2.4.4.1. Professional Knowledge to Support Students With Blindness and Low Vision

Research showed the culture of schools, made up by the beliefs, attitudes and behaviours of staff, can influence the extent to which students with blindness and low vision may feel included or stigmatised (A. Thurston, 2014). However, the *Review of Education for Students with Disability in Queensland State Schools* (Deloitte Access Economics, 2017), identified disparities of practices exist between schools, which impacted the educational experience for students with blindness and low vision.

Staff knowledge about blindness and low vision was identified in the literature as influencing participation in learning for students in mainstream secondary schools. Based on the socio-cultural understandings of the classroom as a community, Whitburn (2014a) asserted that teachers' practices were indispensable to inclusion as their pedagogical practices could either include or exclude students. Further studies supported the need for teachers to have an inclusive and supportive attitude and pedagogy, teaching students as individuals (George & Duquette, 2006; McLinden et al., 2017; Smith et al., 2009). This showed the teacher's ability to normalise differences within a class could decrease the stigma for a person with disability, if the student had access to the curriculum and pedagogy.

Conversely, when teachers had negative attitudes toward students with disabilities, students could feel isolated (Brown et al., 2013). Doepel (2013) proposed that negative attitudes could result from a lack of prior experience and negative assumptions about people with blindness and low vision, along with a lack of teacher training, funding and resources to upskill knowledge about students with blindness and low vision (Reed & Curtis, 2011). The importance of teachers' attitudes was noted by Dawn (2015) who stated that "the fundamental importance of teachers' position in the process of learning is simply undeniable. Their expectations, sensitiveness, priorities and values contribute to the quality of pupils' learning experiences" (p. 2). This was important, in terms of how students felt included, supported, and competent within the school as these experiences influence the development self-concept (Augestad, 2017).

Teachers' abilities to provide accessible curriculum and pedagogy to support students with blindness and low vision was also noted in the literature. Studies showed lack of prior experience with other students with blindness and low vision, which often resulted in classroom teachers not being aware of the needs of students to provide accessible materials (Cain & Fanshawe, 2020; Holbrook, 2015; Siu & Morash, 2014; Southcott & Opie, 2016). A lack of teacher understanding of how to adapt curriculum and pedagogy for students with blindness and low vision was also identified in Brown and Beamish's (2012) research in Australian schools. It was found that even if there were supports within the school to assist classroom teachers to make modifications, they were usually generically trained special education teachers. These teachers may not have had the specific knowledge of the modifications required for students with blindness and low vision to access the curriculum (Brown & Beamish, 2012).

Findings from Opie (2018a) revealed that some teachers had overprotective attitudes for students with blindness and low vision. This included either teaching staff doing the work for students or having lower expectations of what students needed to achieve (Crudden, 2012; Reed & Curtis, 2011). Lowering expectations failed to follow the intent of equal academic expectations underpinned by the National Curriculum and impacted the inclusiveness of the classroom (Crudden, 2012). Fanshawe and Cain (2021) argued that students with blindness and low vision should have the same expectations as their peers when they are equally capable of completing set tasks. It was also important to ensure students had completed all elements of the Australian Curriculum required to be prepared for competitive job markets, where all people tend to be judged equally (Allman & Lewis, 2014; Blackshear, 2014; Brown et al., 2013; Hatlen, 1996; Levin & Rotheram-Fuller, 2011; Lohmeier et al., 2009; Siu & Morash, 2014; Wolffe & Kelly, 2011). These findings identified the crucial role that classroom teachers play and how their understandings and knowledge could impact access to education for students with blindness and low vision.

Teacher aides were identified as supporting students with blindness and low vision in mainstream schools (Opie, 2018a). However, it was also found at times the teacher aide was left with a student with blindness and low vision to give direct instruction, thus blurring the role of teacher and support staff (Keil & Cobb, 2019). Keil and Cobb (2019) raised concerns of teacher aides being in charge of a child's learning, without training in curriculum, pedagogy, and adaptive technology. In the research of Jessup, Bundy, Broom et al. (2018), teacher aides were found to over-supply students with answers, resulting in reduced expectations and effort. For example, one student reported that in "some classes … (they were) … really just sitting there" (Jessup, Bundy, Broom et al., 2018, p. 96). Furthermore, Reed and Curtis (2011) found that teacher aides being attached to students reduced access for the student to the teacher and made it difficult for students to interact with their peers. Other students resisted assistance as they felt working with a teachers' aide meant they had decreased control over their learning or looked different to their peers (Byrne, 2014). These studies showed that while using teacher aides is beneficial to support access to the curriculum, their presence may impact social interactions and agency for students with blindness and low vision.

Knowledge from school administrators was also required to ensure adequate resourcing within the school environment (Australian Federation of Disability Organisations [AFDO], 2013). This is because "the principal is responsible for ensuring that all students with disability are provided with appropriate adjustments to enable them to access the curriculum" (Queensland Government, 2016b, p. 19). However, reviews into the allocation of resources in Queensland and Australian schools for students with disabilities showed disparities in people's knowledge about resource allocation within schools (Commonwealth of Australia, 2016; Deloitte Access Economics, 2017). Specifically for students with blindness and low vision, administrators were responsible for overseeing curriculum access for students and professional development of staff to ensure workforce capability. Administrators also had the capability to request specialist knowledge for the school through external supports, such as advisory teachers and therapists (Commonwealth of Australia, 2016). How the school prioritised time, resources and assistive technology support could be different throughout schools, depending on the level of knowledge of the school administration and types of intervention (Roche et al., 2014).

Professional development for teachers and support staff was identified in the literature as important to increase staff knowledge within schools. Studies acknowledged the unique impact of blindness and low vision to access the curriculum, and the need for teachers to understand this to support students within schools (Ajuwon et al., 2015; McLinden, 2017; Reed & Curtis, 2011). C. Brown et al.'s (2011) study revealed the majority of teachers received 1 to 8 hours of training at the beginning of the year when a student with blindness and low vision was placed in their class, with many receiving none at all. This was further complicated by not enough preparation in pre-service training which has caused an inconsistent approach to the provision of training (Arthur-Kelly et al., 2013; Brown et al., 2011). Further, Reed and Curtis (2011) acknowledged that professional development could be costly for schools, specifically in secondary schools, where multiple teachers required training to make content and pedagogy accessible for students with blindness and low vision (Jessup, Bundy, Broom et al., 2018).

Teacher training in technology was also identified as important to support students' access to the curriculum. Jones et al. (2018) found "the most significant predictor of student assistive technology use is the preparedness of their teachers" (p. 31). The importance of assistive technology was noted in the studies of Opie (2018b) who found that when students in secondary schools could use assistive technology independently, they were afforded control over their own learning. Studies showed that assistive technology was vital for students to access the curriculum and preparedness for future employability as most jobs required knowledge of technology (Kelly & Wolffe, 2012). Ajuwon et al.'s (2016) research asserted that training in assistive technology provided students increased access to information, education, and employment to be successful in a technologically advanced society. These studies showed it was vital for teachers to have an understanding of assistive technology to support students' access to learning.

External supports were often available to provide specialist knowledge to support classroom teachers, school staff and students with blindness and low vision in Queensland schools (Brown & Beamish, 2012; Commonwealth of Australia, 2016). External supports, such as specialised advisory teachers and therapists, were found to be available in all Australian states and territories. Their role was to assist teachers and schools with inclusive teaching practices and support students to access the school's academic, physical and social environments (cf Doepel, 2013; Hollier et al., 2013; Morris & Sharma, 2011). However, in practice, there were limitations evidenced in regards to workforce ability (Brown et al., 2011) and difficulty recruiting qualified personnel (Opie, 2018a; Pogrund, 2017). Similar studies internationally (McLinden et al., 2017), found not every specialist advisory teacher held the relevant qualifications to teach students with blindness and low vision. It was also identified that even if schools did have access to qualified teachers, time was a barrier to advisory teachers providing sufficient support for students in schools. In Opie's (2018a) study, insufficient time to impact schools was highlighted due to high caseloads, the complexity of the job, and the diversity of ages, diagnosis, and skills.

The literature suggested that professional knowledge within schools was essential to supporting students to access learning and provide opportunities for students to engage with the curriculum, as their peers. External supports such as advisory teachers and therapists are provided to support schools with expert knowledge (Queensland Government, 2016b). However, the diversity of knowledge and understanding within and between schools was identified, which created barriers to participation in learning for students with blindness and low vision.

2.4.4.2. Implementation of Disability-Specific Skills to Support Inclusion

Over the past 25 years, a large and growing body of the literature has argued that alongside the academic curriculum, students with blindness and low vision required explicit teaching of the knowledge and skills that were learned incidentally by their peers through vision (Allman & Lewis, 2014; Blackshear, 2014; Brown et al., 2013; Hatlen, 1996; Levin & Rotheram-Fuller, 2011; Lohmeier et al., 2009; Siu & Morash, 2014; Wolffe & Kelly, 2011).

These disability-specific skills, also known as the Expanded Core Curriculum, devised by Hatlen (1996), consisted of nine key areas deemed necessary to compensate for what was incidentally gained by students with regular vision. The skills included:

- Skills to access information
    - compensatory skills (strategies and techniques which allow access to information and visual literacy),
    - assistive technology (use of inbuilt functions within),
    - sensory efficiency (how a person receives and interprets information about their environment without vision), and
    - career education (types of careers and specific skills required).

- Personal skills to participate
    - self-determination (self-advocacy, problem-solving and independent responsibility,
    - orientation and mobility (safe and efficient travel), and
    - social interaction skills (the ability to communicate and work in teams).

- Skills for well-being
    - independent living skills (cooking, getting dressed); and
    - recreation and leisure skills (what recreation is available and how to access it safely) (Allman & Lewis, 2014).

In Australia, SPEVI (2016) enumerated that "in addition to the general (core) curriculum, provision of the Expanded Core Curriculum will maximise the academic, social, vocational and life skills of learners with vision impairment" (SPEVI, 2016, p. 12). However, despite research (Doepel, 2013; Wolffe & Kelly, 2011) that clearly highlighted the success of the disability-specific skills in career and life outcomes for older adults, there was still debate about how the disability-specific skills could be effectively taught to students with blindness and low vision in mainstream classrooms (Wolffe & Kelly, 2011). The disability-specific skills remain as suggestions only, with no clear guidelines as to who was responsible, what they would teach and when they could do this (Keil & Cobb, 2019). Lack of understanding from schools, classroom teachers and families regarding the role the disability-specific skills played in the long-term education of students with blindness and low vision was also identified as a barrier to implementing the disability-specific skills internationally (James, Cobb, & Keil, 2020). Pogrund (2019) renewed the call to implement the disability-specific skills for all students, with blindness and low vision, to enable measurable ways to design and assess development through the knowledge and skills required to be successful in education, employment and community interaction (Education Council, 2014).

This section identified the barriers and enablers to providing support for students with blindness and low vision in mainstream schools. Barriers existed when professional knowledge was not available to assist students to develop the skills to access information. Disability-specific skills were enablers to participation in learning, which could assist students to access the academic curriculum. The following section explores access to employment for people with blindness and low vision.

2.5. Access to Employment for People With Blindness and Low Vision

Gaining and maintaining employment remained a challenge for many students with disabilities (Beamish et al., 2020). The Australian Bureau of Statistics (2015) found 53.4% of people with a disability of working age participating in the labour force instead of 83.2% of people without a disability. The exceedingly high unemployment rate for people with blindness and low vision was increasingly recognised as a matter of concern both within Australia and internationally (Bell & Mino, 2015; Blind Citizens Australia, 2013b, 2020; Crudden, 2012; Cullen, 2011; Koehler, 2020; McMorrow, 2018). In Australia, it was estimated that only 24% of Australian people with blindness and low vision were employed full-time (Vision Australia, 2018). These figures were similar in Canada with 28% of people with blindness and low vision, and 32% in New Zealand, in full-time employment (Vision Australia, 2018) and 44.2% of people with blindness and low vision participating in the American workforce (McDonnall & Cmar, 2019).

High unemployment is concerning when considering employment generated wages, provided a sense of purpose and is argued to be to be integral to facilitating inclusion (Blind Citizens Australia, 2013b; Cullen, 2011). The following section explores barriers to accessing the workplace for people with blindness and low vision, along with preparing students for future employment.

2.5.1. Barriers to Access the Workplace for People With Blindness and Low Vision

Despite recent research and practices implemented to show the benefits of a diverse workforce (Cullen, 2011; McDonnall & Crudden, 2018), discrimination and barriers still existed for people with blindness and low vision in gaining and maintaining employment in Australia (Vision Australia, 2021a, 2021b). Barriers were identified in relation to negative attitudes from employers, accessibility within the hiring processes, and access within the workspace.

Negative attitudes by employers created hesitation in hiring people with blindness and low vision over their sighted peers, regardless of background and skills (Dong et al., 2017). The *Willing to Work* report (Australian Human Rights Commission, 2016) noted that potential employees with disabilities felt that negative employer attitudes posed the largest barrier to employment. These findings were supported by a report *Response to Issues Paper: Employment* to the *Royal Commission into Violence, Abuse, Neglect and Exploitation of People with Disability* (Blind Citizens Australia, 2020), whereby people with blindness and low vision expressed frustration at gaining a job, even though they were suitably qualified. It further detailed that it took longer for graduates with blindness and low vision to find employment (Blind Citizens Australia, 2020).

Barriers to obtaining employment were also identified within the hiring process (McNeil, 2019). Lack of accessibility to online platforms or incompatibility of technology to access the applications were reported as barriers for people with blindness and low vision (McDonnall & Cmar, 2019). Visual diagrams, and pictures within the application forms, or other pre-interview assessments created inequitable access for people with blindness and low vision (Naraine & Lindsay, 2011). These findings indicated that despite legislature to decrease discrimination in accessing employment, barriers due to the visual nature of the application impacted people with blindness and low vision. However, studies have shown that with good use of technology and agency, people can use workarounds, or use their own technology to access information (McLinden et al., 2020).

Transportation to the workplace and mobility within the work environment were identified as a concern for respondents in the study *Barriers to Employment* (McMorrow, 2018). For people with blindness and low vision who can not drive, public transportation to get to and from work may influence access to the workplace (Crudden et al., 2015). Lindsay (2011) found that people with blindness and low vision, who relied on public transportation, could face barriers in rural areas with limited services. Enablers to accessing employment included “flexible schedules … working from off-site locations, or subsidize[d] transportation” (Crudden, 2015, p. 458).

Lack of orientation and mobility training to become confident with independent navigation was also identified in the literature as impacting employment (Crudden, 2012). Similarly Schuck et al. (2018) purported that providing prior orientation and mobility training acted to support the individual’s problem-solving skills and confidence, increasing competence in the workforce. Barriers to employment through access to the workspace identified that orientation and mobility skills were important for people to have the confidence to access employment (Blake, 2021).

Accessibility of work materials was raised as a barrier to employment by Steverson (2020). High braille literacy skills were reported to be a strong predictor for individuals succeeding in higher levels of education and employment (Guerreiro et al., 2013). Additional research has shown that people who were exposed to early braille literacy had a better chance of success in education, employment, and social interaction (Doepel, 2015; Janus, 2011; Makin & Spedding, 2012; McGee & Richgels, 2014; Salmon, 2014). Australian studies of people with vision impairment, who were employed, showed that over 85% used braille to communicate in the workforce (Blind Citizens Australia, 2013b; Doepel, 2015; Vision Australia, 2012a, 2012b). Despite evidence of braille being a predictor to employment, the use of braille has declined significantly over the past few decades (Toussaint & Tiger, 2010; Wang & Al-Said, 2014). According to Guerreiro et al. (2013), braille had become redundant as adaptive technology devices such as magnification, screen readers and accessibility options in mainstream technology capture and read aloud text. However, Odame et al. (2021) suggested that employers were not going to be able to provide accessible materials in braille and therefore assistive technology was considered more relevant to access information in the future. This showed that braille was believed to be useful for literacy in the workplace, however other technologies were also being used to access information.

The knowledge and ability to use assistive technology to access work efficiently was seen as a study found that access to content should be more accessible (McDonnall & Cmar, 2019; Vision Australia, 2018). For people with blindness and low vision to use technology confidently in the workplace, knowledge and skills in using technology (Kelly & Wolffe, 2012). Douglas and Hewett (2014) suggested that if students had been using technology since a young age and had agency in their selections of technology, they would be more likely to advocate for their needs as adults. Similarly, Kaine et al. (2019) believed that preparations for future employability began in school to increase confidence in the workforce.

Preparation for work was identified as impacting access to employment. Lund and Cmar (2020) recently conducted a systematic review of factors related to employment in transition-age youth with vision impairment. This study found that previous work experience was the most significant predictor of employment (Lund & Cmar, 2020). Work experience may be useful for people with blindness and low vision who are unable to visualise careers. This may mean people are not aware of expectations required within jobs, which may impact employment aspirations (Kaine & Kent, 2013). However, if people with blindness and low vision had paid or voluntary roles, they were more likely to gain employment (Danaher, 2019). Whether paid or voluntary, previous participation in work enabled people to develop skills such as time management, commitment to work, and interpersonal skills to work in a team (Danaher, 2019; Odame et al., 2021). Conversely, if people felt underprepared or under confident in their skills, it was a barrier to employment (Kim & Kim, 2015). For this reason, Hewett et al. (2014) believed that support in the secondary school to prepare students with blindness and low vision for the transition to employment would empower students to develop the agency required in the workforce.

2.5.2. Graduate Preparedness

Increasing awareness of preparing students for the transition from secondary school to employment has been considered internationally. Findings from recent OECD working papers indicated an association between adult employment outcomes teenage career readiness (Covacevich et al., 2021). Through recent longitudinal study across developed nations, data suggested that students who were explicitly prepared for employment through career conversations and work experience had lower unemployment levels (Covacevich et al., 2021).

Within Australia, transition to employment formed the focus of the *National School Reform Agreement* (CAG, 2018), a joint agreement throughout Australian States and Territories, to remove inequalities in education and increase student transition outcomes. An important goal of the agreement was for all students to "gain the skills they need to transition to further study and/or work and life success" (CAG, 2018, p. 7). This goal implied that all students, regardless of ability, should prepare for future education and employment as a focus within a school. Similar goals in the Australian National Curriculum (ACARA, 2013) identified the role of education for the preparation of all students for their future employment. A focus on social and personal capabilities required for employment were included in the curriculum (ACARA, 2013). Additionally, a focus on the transition to employment has also been evident in increased Vocational Education and Training (VET) options (Queensland Government, 2016a). Students can participate in certificates that develop skills and work-related competencies as subjects in the secondary curriculum (Queensland Government, 2016a). These reforms put an important focus of secondary schools, as preparing all students for future employability.

However, despite the implementation of these agreements and policies, in reality, for people with blindness and low vision, there are unique barriers that result from vision loss, which result in significant difficulties in accessing the curriculum (Ajuwon et al., 2015; McLinden, 2017; Reed & Curtis, 2011). These barriers were problematic if not overcome, as the pathway to employment for people with disabilities was influenced by inclusion in education and gaining the necessary skills to transition to the workforce (Beamish et al., 2020).

The literature identified the role that disability-specific skills played in education and clearly highlighted the success of disability-specific skills, in career and life outcomes for older adults (Allman & Lewis, 2014; Blackshear, 2014; Brown et al., 2013; Hatlen, 1996; Levin & Rotheram-Fuller, 2011; Lohmeier et al., 2009; Siu & Morash, 2014; Wolffe & Kelly, 2011). It highlighted the role that students needed explicit teaching of disability-specific skills, that sighted peers gain incidentally, to successfully interact with the academic curriculum (Allman & Lewis, 2014). However, as secondary was so focused on the academic curriculum, students lacked the requisite time to learn the disability-specific skills required to access the academic curriculum (Kuhl et al., 2015). Therefore, identifying that students with blindness and low vision need access to disability-specific skills to participate in learning and prepare for future employability, however lacked time to access explicit teaching of these skills.

2.6. Gaps in the Literature

The literature review has identified the nature of blindness and low vision and the profound impact on the development of a person. The history of the education of students with blindness and low vision has been explored. The literature revealed that participation in learning can reduce the disability of a person, if they can access the curriculum at the same level as their peers. An overview of barriers and enablers to employment were identified to understand what prevented people with blindness and low vision in gaining employment. The literature supported that preparing students for the transition post-school was important for future employability. However, gaps were identified in the research that this study aimed to address. This included a lack of research including: a) embracing the perspective from a range of stakeholders and b) focusing on education as preparing students with blindness and low vision for future employment. These gaps are described in this section.

2.6.1. Limited Research Embracing a Range of Stakeholders

A small number of studies have focused on the experience of students in mainstream secondary education in Australia (Cain & Fanshawe, 2019a, 2020, 2021; Jessup et al., 2017; Jessup, Bundy, Broom et al., 2018; Jessup, Bundy, Hancock et al., 2018; Opie, 2018a, 2018b; Whitburn, 2014c). Other studies have explored education through the lens of students, parents, and their teachers (Cain & Fanshawe, 2020, 2021; Cain et al., 2021; Fanshawe & Cain, 2021). Brown and Beamish (2012) examined education through the role of the advisory teachers, while Doepel (2013) identified people with blindness and low vision who experienced education in the Australian system. While previous studies have used systems models to examine developmental outcomes for students with blindness and low vision within the education systems, proximal processes have not been proposed (Kamenopoulou, 2012; McLinden and McCracken, 2016; McLinden et al., 2020). This study aims to fill this void by using a Bioecological Systems Model (Bronfenbrenner & Morris, 2005), to examine the impact of Person-Process-Context-Time on the developmental outcomes. The study aims to understand the holistic ecosystem of students with blindness and low vision in mainstream secondary schools.

2.6.2. Limited Research That Focuses on Education as Preparation for Employment

The literature highlighted barriers and enablers in education for students with blindness and low vision. Other studies and identified barriers and enablers in employment for students with blindness and low vision. However, to date, no known studies have taken a holistic approach to look at the barriers and enablers in mainstream secondary schools that enable students to participate in learning and prepare for future employability. This study aims to understand what factors in secondary schools impact students' future employment. This is important, as all students should feel confident about their future employment options (Gunawan et al., 2021).

Using a Bioecological systems approach, the perspective of multiple stakeholders will be gained to understand the complex ecosystem of students with blindness and low vision in mainstream secondary schools. It is hoped the insight will provide an understanding as to how to increase the employment rate for future generations.

2.7. Summary

After defining the key terms used in this study, this chapter explored the literature in the field of blindness and low vision. First, examining the functional impact of vision loss on a person and their education, through a socio-cultural lens. It outlined the educational context for students with blindness and low vision, including legislature and policy, which have impacted inclusion in mainstream schools over time. The literature review explored the barriers and enablers to employment for people with blindness and low vision.

Exploration of the research identified two significant gaps in the literature. First, there have been a small number of studies that have examined several stakeholders' perspectives of education for students with blindness and low vision. This research will examine a holistic understanding through the lens of multiple stakeholders within the students' ecosystem. Second, there is limited research investigating education for students with blindness and low vision involving their transition to employment post-schooling. There are studies which examine people with blindness and low vision in employment, yet there does not appear to be research that specifically looks at the impact of mainstream secondary school and the impact of future employability for students with blindness and low vision. These significant gaps were identified to frame the research design of this study.

The following chapter outlines how the Bioecological Systems Model (Bronfenbrenner & Morris, 2005) will be used as the conceptual framework in this study. The model will enable an holistic understanding of students with blindness and low vision in mainstream secondary schools and provide a voice to multiple stakeholders who interact within the ecosystem.

Chapter 3. Conceptual Framework

3.1. Introduction

This chapter discusses the conceptual framework used to guide this research. Based on the work of Bronfenbrenner and Morris (2005), the conceptual framework used for this research was the Bioecological Systems Model. This model viewed children not just as individuals, but within a system of relationships that all worked together within their adjoining environments for their personal, social and cultural development (Moore et al., 2020). As such, this study was designed to understand the entire ecosystem surrounding students with blindness and low vision. It considered various stakeholders within this system (parents/carers, teachers, advisory teachers, therapists, policy-makers, adults with lived experience of blindness, employment consultants, and employers). Stakeholders were considered for their perceptions of barriers and enablers for students with blindness and low vision in mainstream secondary schools, and implications for the students' future employment. A Bioecological Systems Model (Bronfenbrenner & Morris, 2005) was most suited to providing a systematic method to research the impact of influencing factors for students with blindness and low vision as it enabled a systematic method to examine factors within the students' entire ecosystem.

3.2. Overview of Bronfenbrenner's Systems Models

Bronfenbrenner (1917–2005) was a Russian psychologist who devoted much of his life to designing systems models to help understand how child development was influenced by environmental factors. Systems models included the original Ecological Systems Model (ESM) (Bronfenbrenner, 1979, 1995, 1996) and the evolved Bioecological Systems Model (BSM) (Bronfenbrenner & Morris, 2005) used in this study. Bronfenbrenner's systems models were based on a biological understanding of the interactions between an individual and living and non-living organisms within a particular environment (Bronfenbrenner, 1979, 1995, 1996). The models offered a way to understand individuals within their context and the interdependent relationships within this environment, which influenced their development (Eriksson et al., 2018). In the earlier iterations of the ESM, Bronfenbrenner conceptualised the idea of "the developing person, of the environment, and especially of the evolving interaction between the two" (Bronfenbrenner, 1996, p. 3), as a way of explaining child development and variances between children in different environments.

In the ESM, Bronfenbrenner (1979) referred to the environment as a nested structure (was that the impact of factors within the ecosystems influenced the individual and other stakeholders within the system (Figure 3.1), whereby the individual being studied was at the centre of any selected context. Surrounding the individual were several systems, which included:

- microsystem (factors involved a child's immediate settings, such as home, school),
- mesosystem (the interactions between these settings, e.g., teacher—parent/carer),
- exosystem (external ecological environments which influenced the child, even if people or objects within the system did not have direct contact with the individual), and
- macrosystem (laws and belief systems that might have influenced the other systems).

The overarching premise of systems models (Bronfenbrenner, 1979) was that the impact of factors within the ecosystems influenced the individual and other stakeholders within the system.

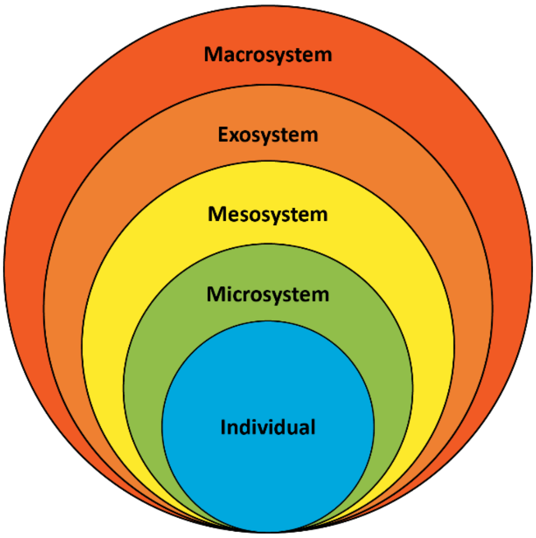

Figure 3.1 **Ecological Systems Model (Bronfenbrenner, 1979)**

Bronfenbrenner's model evolved as he refined the framework based on new knowledge (DiSanti & Erickson, 2020). As such, in 1979, he added a chronosystem to the outer layer of the diagram, which accounted for change that individuals experienced over time. The chronosystem represented these changes, both over time and within the individuals' surrounding environment (Bronfenbrenner, 1979). Time represented how long was spent in each microsystem (e.g., school, sports practice etc.), the decade in which they were born, time through the individual's life, and the timing of certain events (Figure 3.2; Buser et al., 2020; Martinello, 2020). Bronfenbrenner continued to refine the theory, BSM the most notable, according to Rosa and Tudge (2013) was the addition of the proximal processes introduced with co-author Morris (Bronfenbrenner & Morris, 2005).

Proximal processes were bidirectional interactions with people or objects that positively affected the person at the centre of the ecosystem (Merçon-Vargas et al., 2020). Bronfenbrenner viewed proximal processes "as having positive effects on development (by increasing competency or buffering dysfunction)" (as cited in Merçon-Vargas et al., 2020). The proximal processes were believed to have the most powerful impact on the individual and their development, especially if they interacted with the person regularly and frequently (Ashiabi & O'Neal, 2015). This evolution of the systems model to include proximal processes became known as the Bioecological Systems Model (BSM) (Bronfenbrenner & Morris, 2005). The BSM included four important elements of the ecosystem *Process-Person-Context-Time* (PPCT) as shown in Figure 3.2.

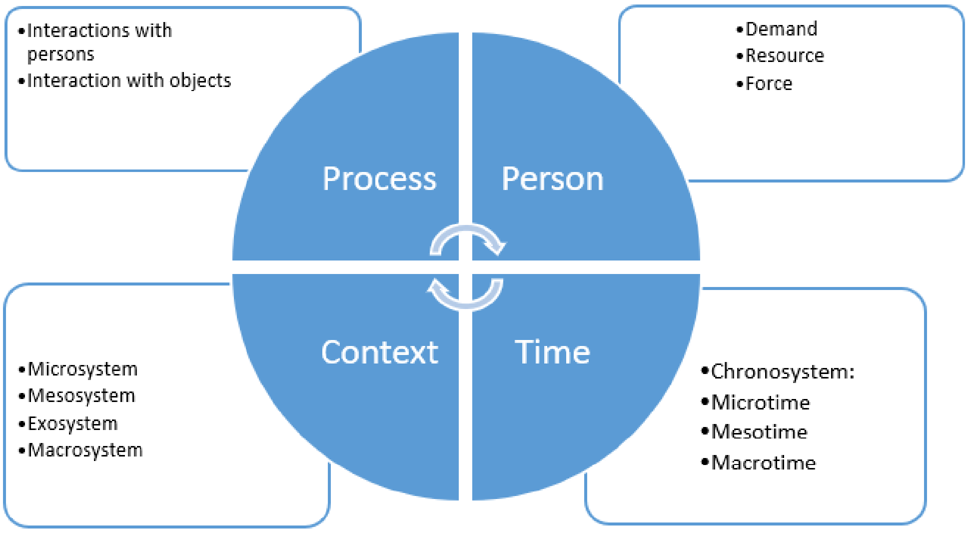

Figure 3.2 Bioecological Systems Model (Bronfenbrenner & Morris, 2005)

The BSM additionally expanded the importance of the individual to include the person's characteristics which might have impacted development (Tudge et al., 2016). These characteristics included: demand characteristics (innate qualities such as age, gender, and physical appearance), resource characteristics (such as skills, intelligence, social, and material resources), and force characteristics (temperament, motivations, and persistence) (Bronfenbrenner & Morris, 2005).

Despite the holistic inclusion of Process-Person-Context-Time, and the greater focus on the individual characteristics of the person, take-up of the BSM was less evident in the literature, as observed by a number of scholars (Eriksson et al., 2018; Tudge et al., 2009; Tudge et al., 2016). In examining 25 studies using the BSM, Tudge et al. (2009) found that only four of these had used PPCT concepts and the rest opted for the original version, sans processes and time. When replicating the review with the same methods, nearly a decade later (Tudge et al., 2016) the authors found 20 publications claiming to be based on BSM, however, only two utilised the four elements of process-person-context-time. Eriksson et al., (2018) analysed 16 articles in mental health to have located only five studies that included time and two that included processes. Interestingly, Eriksson et al., (2018) further discovered that only 50% of the studies analysed interactions of all ecosystems, and 20% examined interrelationships between the systems. Thus, despite quickly becoming an important framework in research (Eriksson et al., 2018), the interpretation of the BSM and its application appeared broad. This current study involving students with blindness and low vision, aims to incorporate PPCT by specifically identifying elements in the systems that might impact individuals. Therefore, the BSM was selected to provide an holistic approach to understand students with blindness and low vision in mainstream secondary schools and the perceptions of multiple stakeholder's within their ecosystem.

3.3. Suitability of the Bioecological Systems Model for This Study

The Bioecological Systems Model was developed to understand the learner in relation to their environment. It also based on socio-cultural philosophies which had relevance to people with disabilities. The use of the BSM provided a space to challenge the deficit-based medical approach to disability, to investigate how an individual might experience a disability. Functional understandings of disability, are based on socio-cultural theories by Vygotsky (1978), whereby an individual's medical condition is only a disability when school processes, pedagogy, and others' beliefs allowed it to be. In the context of this research, for a student with blindness or low vision in mainstream secondary school, interactions within their unique micro, meso, exo, macro and chronosystems influenced how their medical eye condition might be perceived as a disability. Use of the BSM (Bronfenbrenner & Morris, 2005) provided a suitable conceptual framework to understand the impact of blindness and low vision for students in mainstream secondary schools. The BSM aimed to understand not only what the student experienced but also how influences from within the ecosystem could impact the student's developmental outcomes.

Bronfenbrenner was not alone in acknowledging the impact of the environmental context in the development of a child. Simmel *proposed the intersection of social circles* in his 1908 chapter on sociology to explain similarities and differences in development (Stoetzler, 2016). Lewin (1935) for example, recognised that behaviour of a person was the function of the person and environment "*B = f (PE)*" (p. 73). McCall (1977) suggested the need to consider "behaviour as it typically develops in natural life circumstances" (p. 334) and other ethnologists (Jones, 1972; McGrew, 1972) also studied human behaviour within the environment, but limited to the immediate surroundings. Alternative models, such as socioecological models were "similar in that they consider the complex interplay between a range of interrelated factors, including individual, relationship, community and societal factors" (Hill, 2021, para. 3).

What differentiated Bronfenbrenner's systems models in child development was his belief that children did not develop purely by the content and knowledge they learned but were also "affected by relations between these settings, and by the larger contexts in which the settings are embedded' (Bronfenbrenner, 1996, p. 21). Therefore, the BSM accounted for the environments that the children interacted within every day and the interrelationships with other systems and exosystems that influenced the environment (Bronfenbrenner & Morris, 2005). The BSM attempted to explain the diversity in child development due to these complex environments (Knowles, 2011). As Walker and Pattison (2016, p. 12) explained "a child develops interactively, in response to various levels of environmental relationships and influences. The ecological framework situates the child at the centre of the world, and it considers the child as an active participant in his/her learning and development." Hence, the systems models were intended to allow researchers to understand the person in relation to their environment.

3.4. Application of Bronfenbrenner's Systems Models in Research

The systems models to understand child development evolved over time. The original Ecological Systems Model (ESM) proposed by Bronfenbrenner was intended as a psychological model to help understand a child's development. The systems model invoked thinking about the environmental context of the child when considering behaviour (Bronfenbrenner, 1979). Later evolutions of the ESM, also included time, as an important influence on child development. The latest iteration of the systems model, was the Bioecological Systems Model (BSM), developed with Morris (Bronfenbrenner & Morris, 2005). The BSM added emphasis on the person (bio meaning life), to include characteristics of the person and the proximal processes which had the most profound impact on the individual (Bronfenbrenner & Morris, 2005). Both the ESM and the BSM have been found useful by researchers requiring a systematic approach to inform social policies and programs (Murphy, 2020).

Aside from the psychology field, Bronfenbrenner's models have been applied by researchers in a) education systems, b) disability studies, and c) blindness and low vision. These studies based on ESM and BSM were reviewed to understand the application of Bronfenbrenner's models in research and how they could transfer to examine the ecosystem of students with blindness and low vision in Australian mainstream secondary schools.

3.4.1. Education Contexts

Within education, systems models have been used to investigate practices at an institutional level. Everson (2015) and Ozaki et al. (2020) used ESM when considering which elements in a tertiary institution supported student resilience. McLinden (2017) applied it to understand the differences between experiences in higher education for part-time students. Bluteau et al. (2017) added to this investigating the nested influence of the systems to understand how university students developed identity and professionalism. Within schools, researchers have examined factors in the ecosystem to examine the school climate (Rudasill et al., 2018), address school bullying and violence (Jun Sung & James, 2012; McGuckin & Minton, 2014), and promote well-being (Bravo-Sanzana et al., 2020). Smith et al., (2017) focused on school leadership and examined the influence of policies and practice on teachers who have become teacher leaders. Similarly, Drakenberg and Malmgren (2013) explored the basic values of school Principals and the impact of these values and other influences in implementing the national curriculum in their schools. These studies showed the usefulness of systems models in understanding the complex ecosystems within school environments.

ESM has been used in an attempt to understand disadvantages in various educational contexts. Nand (2017), for example, used questionnaires to incorporate the students' perceived influence of their microsystem (specifically socio-economic status) on their decision to leave school early and reconnect later through vocational education. Similarly, Williams (2016) examined the school counsellor's role in preparing students in foster care for career and college. While Yu et al., (2013) found time involved in activities influenced engagement for students with behaviour problems. Specifically, in Australia, systems models have been used to examine Indigenous histories (Manning, 2017) and music (Crooke, 2015) which used ESM to show that factors in the ecosystem influenced and were influenced by the individual. Students with blindness and low vision can be considered disadvantaged in education, as they have unique access needs to the curriculum (Ajuwon et al., 2015; McLinden, 2017; Reed & Curtis, 2011). Therefore, these studies were useful to understand that multiple factors within ecosystems influenced students' access to education (Panopoulos & Drossinou-Korea, 2020).

3.4.2. Disability Studies

Within disability studies, systems theories were used as a theoretical framework to examine the impact of a person's characteristics, specifically their disability, and its impact on developmental outcomes. Pinder-Amaker (2014) used ESM to examine successful academic and mental health outcomes for tertiary students with autism. By interviewing 20 successful college graduates, the author explored the characteristics of the person with autism which made the transition successful (Pinder-Amaker, 2014). This study was useful to understand the context of students with disabilities transitioning post-school. Moore et al. (2020) used the BSM to investigate the factors within the ecosystems that supported employees with disabilities to be successful and enablers were inclusive policies and cultures. Algood et al. (2013) identified factors in the ecosystem which influenced parenting success for families of children with a disability. This built on earlier work to find the risk factors in the ecosystem for maltreatment of children with developmental disabilities (Algood, et al., 2011). These studies were important in establishing the use of systems models and the diverse way researchers used the models to identify barriers and enablers to the developmental outcomes for a person with a disability. This study aimed to identify barriers and enablers to participation in learning and future employability for students with blindness and low vision.

Specifically, in relation to blindness and low vision, Kamenopoulou (2012) applied Bronfenbrenner's framework as a systematic way to explore the social inclusion of students who were deaf and/or blind in mainstream schools. McLinden and McCracken (2016) used ESM to examine the role of the vision support teachers and what afforded their influence within schools. In a separate study, McLinden, Douglas et al. (2016) employed ESM when examining the role of the specialist teacher to facilitate access to the curriculum for students who are blind or have low vision. The study stated it "is original in being the first to examine the role of the specialist teacher of children and young people with vision impairments through such an analysis" (McLinden, Douglas et al., 2016, p. 180). Other authors have explored the chronosystem and its impact on people with blindness and low vision (Kamenopoulou, 2016, p. 515). Kaine et al. (2019) identified the influence of time by noting that students with blindness and low vision must prepare to transition to work from a young age. It was relevant for this study to explore the importance of time, as students prepare to transition from mainstream secondary schools to further education or employment. McLinden et al. (2020) used BSM to identify influences for students with blindness and low vision to empower agency in education. While influences were noted, McLinden et al. (2020) did not identify proximal processes, which this study aimed to do. To address this gap, this study used the BSM, to build on current literature and identify the proximal processes within the ecosystem. The study aimed to identify barriers and enablers that influence these processes for students with blindness and low vision in mainstream secondary schools.

3.5. Criticisms of Bronfenbrenner's Systems Models

While Ecological Systems Models and Bioecological Systems Models have been used as an holistic theoretical framework to understand an individual, concerns of the validity of the model have been raised by researchers, alluding to issues with a) methods of mapping the ecosystem, b) not reporting both positive and negative social realities and c) the working usefulness of Bronfenbrenner's model.

3.5.1. Methods of Mapping the Ecosystem

Questions about how the researcher would map the ecosystem they were examining, were raised in the literature. Kitchen et al., (2019) questioned the validity of the researcher mapping the ecosystem as they determined which people might influence the individual. Kitchen et al., (2019) called for researchers to ensure that the person being studied had agency in identifying living and non-living things of importance within their ecological circles. Newbury (2011) also held this view and further warned that no one could be an expert in others' lives or experiences.

Conversely, Murphy (2020) asserted that systems models, when focused on the individual, could afford the person to have a voice in the research. Murphy argued for careful research design to ensure the students themselves could identify elements within the system that impacted them. Ensuring the person was at the centre of the research was an important finding for the research design of this study. McDonnall and Cmar (2019) supported that elements should also include non-living things, such as technology and access to technology. The BSM included proximal processes which had a profound influence across the ecosystems for the person. Identifying the proximal process which was non-living, had additional significance for this study, as students with blindness or low vision use assistive technology to access education and employment.

In addition to the proximal processes, the BSM focused on the person's characteristics, which may influence the developmental outcomes, which was not evident in the earlier ESM. A significant number of studies, such as Pinder-Amaker's (2014) study of tertiary students with autism, or Williams' (2016) study of students in foster care, did not focus on an individual. They focused on a collective of individuals who had similar circumstances (such as autism or in foster care). What made up an individual was an important dimension when discussing a collective of individuals as they will have different inherent qualities (Cala & Soriano, 2014; Reed & Curtis, 2011; Smit et al., 2020; Tinto, 2010), attitudes and beliefs (Oliveira et al., 2020), along with temperament and behaviours (Smit et al., 2020). To ensure validity, this required the author to consider how to map the ecosystem to select individuals. Specifically, in this study, blindness and low vision was such a heterogeneous condition (Cain & Fanshawe, 2019b), with individuals having different levels of vision, reasons for vision loss, socio-cultural circumstances, and geographic locations. The characteristics of each individual within this group were evidenced as very diverse. Therefore, participant recruitment was an important consideration to account for the diversity within a collective or group of students with blindness and low vision.

A further criticism of mapping the ecosystem to examine the developmental outcomes of a person, was related to researchers choosing which system they wished to focus on rather than examining the ecosystem as a whole. Other studies across the discipline that examined only one level of the ecosystem (Algood et al., 2013; Buser et al., 2020; DiSanti & Erickson, 2020; Eriksson et al., 2018; McLinden, 2017; Moore et al., 2020; Murphy, 2020; Nand, 2017; Walker & Pattison, 2016; Williams, 2016). Onwuegbuzie et al. (2013) argued focusing on one level only did not afford the intent of Bronfenbrenner's model as "four-level conceptualization has important implications for generalization (e.g., policy, practice) because it helps the researcher bound the inquiry or conceptual/theoretical framework with respect to the generalizability of the findings" (p. 6). Hence, this study addressed these criticisms, by designing the research to encompass all levels of the ecosystem to gain multiple stakeholder perspectives.

3.5.2. Positive and Negative Social Realities

A second criticism of using systems models was identified when researchers do not examine both the ecosystem's positive and negative social realities (Rothery, 2016). To gain a complete analysis of the environment, Rothery (2016) argued that researchers must be reminded of their impartial role to understand an individual through their own social and culturally "valued norms and expectations" (Guhn & Goelman, 2011, p. 212). Researchers were encouraged to look at the big picture of social justice within the framework, highlighting that not all interventions may be helpful to all individuals (Rothery, 2016). This study addressed this criticism by identifying barriers and enablers by listening to multiple stakeholders within the ecosystem of students with blindness and low vision within mainstream secondary schools.

3.5.3. Working Usefulness of the Model

Other criticisms of Bronfenbrenner's works, resulted from the visualisation of the systems models. Within Bronfenbrenner's framework, "the visual metaphor is a series of concentric or nested circles which represents a level of influence on behavior" (McLaren & Hawe, 2005, p. 9). The visual representation has been criticised for being proposed as a model when it is too abstract (Wakefield, 1996a, 1996b). Similarly, Xia et al. (2020) accused Bronfenbrenner of not providing substantive accompanying information to operationalise the visual model as a theory. Conversely, others (Rothery, 2016) argued that the abstract nature of the model was a benefit to researchers.

Rothery (2016) stated that researchers could use the framework to suit the needs of the individual and environmental context. As a result, additions and alternate visual representations have been proposed, some of which are outlined in the following section.

3.6. Visualisation of Bronfenbrenner's Systems Models

Bronfenbrenner's original intention of the ESM was "the conception of the developing person, of the environment, and especially of the evolving interaction between the two" (Bronfenbrenner, 1979, p. 3). Modifications to the systems models have been developed to represent this interaction, operationalise the model, or personalise to meet the needs of the discipline and the study (Rothery, 2016). For example, the health discipline named the nested within the ecosystem: intrapersonal realm, interpersonal processes, community, and public policy (McLaren & Hawe, 2005; Richard et al., 2011).

Other researchers redesigned the visual representations to best suit their research needs. While noting Bronfenbrenner's ecosystems consisted of multidirectional influences, White (2007) stated that nesting the ecosystems around the individual could represent "isolated, discrete dimensions" (p. 241). White (2007) instead proposed a *web of praxis* as an alternative to visualise different ecosystems, which showed influences as an intertwined web, which helped to understand what people are doing, knowing, and being (Newbury, 2011). Neal and Neal (2013) also supposed ecosystems should not be thought of as nested, and similar to White (2007), proposed a *networked model of ecological systems*. Within the network, each element was "directly or indirectly connected to the others by the direct and indirect social interactions of their participants" (p. 722). While webs and networks provided a way to visualise the ecosystem, Clarke (2005), proposed situational maps to display the relationships within the ecosystem. Clarke contended this allowed the information to be interrogated utilising a more grounded approach which allowed an "opening up" of the data to be interpreted within the context.

Despite different visual representations proposed, many researchers have more simply adapted the concentric circles, incorporating different ways of representing information pertinent to their study. Within this study, it was essential to find a model that incorporated the PPCT concepts depicted by Bronfenbrenner & Morris's (2005) Bioecological Systems Model. One model proposed by Doughty and Moore (2020) used the concentric circles (Figure 3.3), and added communication, relationships, and alignment across the concentric circles to represent interactions. This model was initially used to guide this research, as it provided a visual framework to understand the BSM for people with disabilities.

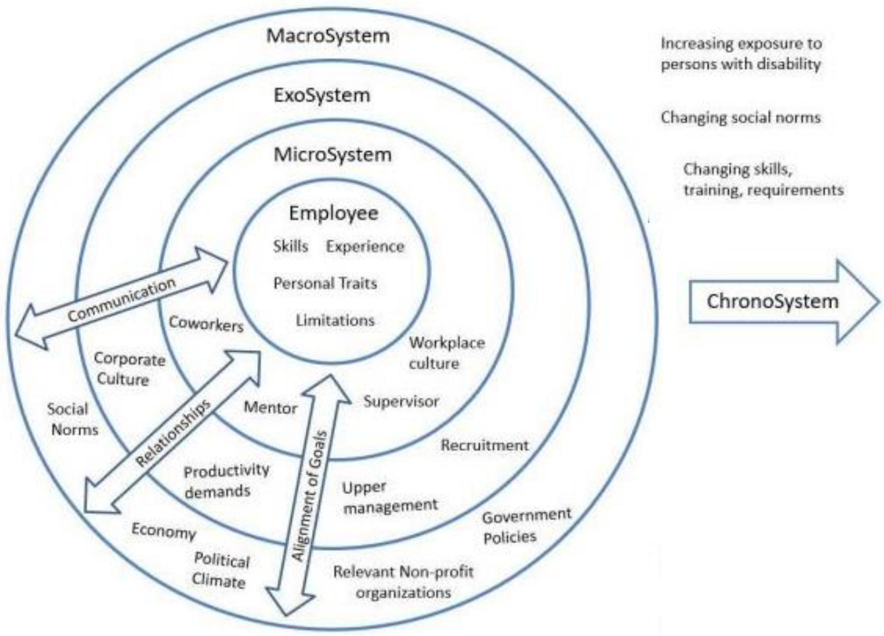

Figure 3.3 **Model of an Inclusive Workplace (Doughty & Moore, 2020)**

3.7. Application of Bronfenbrenner's Bioecological Systems Model for This Study

The Bioecological Systems Model was carefully selected as the conceptual framework to examine the ecosystem of students with blindness and low vision in mainstream schools. The BSM was considered a useful model for this purpose as it allowed the identification of multiple stakeholders within the ecosystem and provided a systematic way to conduct research. Additionally, the BSM was useful to understand the additional elements of the person, processes throughout the ecosystem, the context, and time on the developmental outcomes of students with blindness and low vision.

The model proposed by Doughty and Moore (2020) was initially used to frame the study and identify stakeholders within the ecosystem. However, when working with the data findings, it was noted that this model lacked inclusion of the chronosystem and proximal processes embedded within the system. Therefore, the model was revisualised (see Figure 3.4) to enable the author to scaffold the discussion and present findings. This revisualised Bioecological Systems Model is proposed as a tool for future researchers when examining individuals within ecosystems and presented in the concluding chapter.

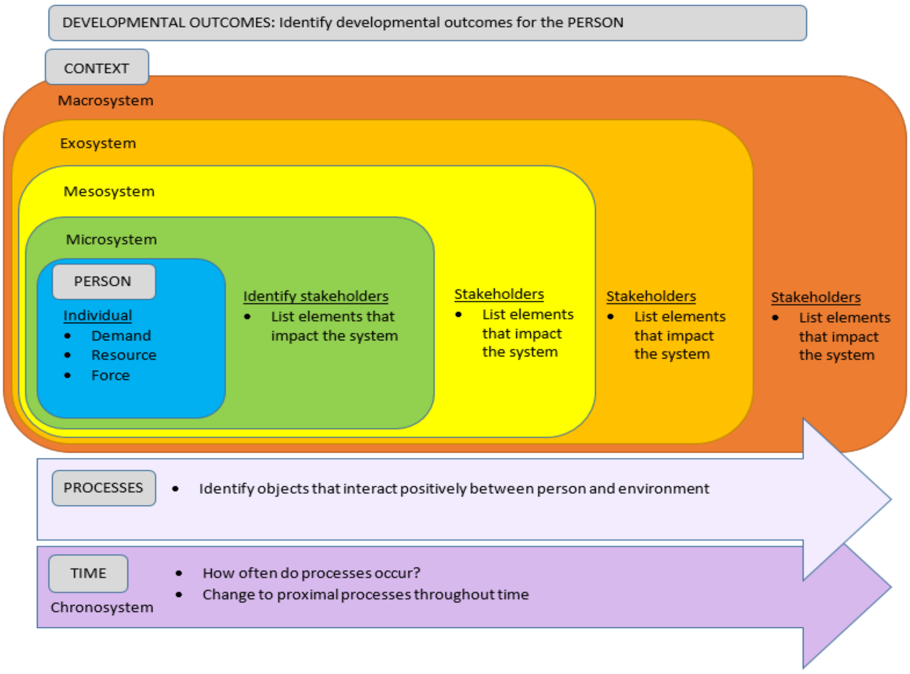

Figure 3.4 **Revisualised Bioecological Systems Model (based on the work of Bronfenbrenner & Morris, 2005)**

3.8. Summary

This chapter introduced the theoretical framework that will be used to underpin this study. It began by exploring the development of Bronfenbrenner’s systems models. The ESM focuses on the person, their context, and in later iterations, the impact of the chronosystem on the person (Bronfenbrenner, 1979, 1995, 1996). In later works, Bronfenbrenner and Morris (2005) introduced Person—Process—Context—Time as influencing the developmental outcomes for the person at the centre of the ecosystem. This model included the addition of proximal processes to identify the profound influence of living and non-living factors in the ecosystem. The model also focused on personal characteristics that influenced the person and identified demand, resource, and force characteristics. After these changes, the model was renamed Bioecological Systems Model, (bio meaning life), acknowledging the additional focus on the person (Bronfenbrenner & Morris, 2005).

The application of the systems models in research was examined. Studies were explored from educational contexts, disability studies, and specifically from research that examined the ecosystems of people with blindness and low vision. Research into the variants provided insight into how systems models could structure research for this study. Following this, the criticisms of Bronfenbrenner’s systems models were explored. The criticisms were noted to ensure validity when using Bioecological Systems Model when designing and undertaking the research.

The chapter also examined different visual representations used in the research to contextualise the BSM into practice. Bronfenbrenner presented concentric circles to represent the ecosystem, which was criticised for being difficult to operationalise. Although alternate formats such as networks and webs were proposed, this study initially adapted the concentric circles, with the addition of the elements of the chronosystem, by Doughty and Moore (2020). However, this model also became difficult to operationalise and a revisualised BSM evolved within the research process. The revisualised BSM was used within this study as a structured model to examine the multiple stakeholders in the ecosystem of students with blindness and low vision in mainstream secondary schools. It is further proposed that this model can be used by future researchers when examining developmental outcomes within an ecosystem.

Chapter 4. Methodology and Methods

4.1. Introduction

This study aimed to identify barriers and enablers to participation in learning and future employability for students with blindness and low vision in mainstream secondary schools. The previous chapters examined the literature around inclusion, education, and employment of students with blindness and low vision. The Bioecological Systems Model (BSM) (Bronfenbrenner & Morris, 2005) was then introduced, which was used to inform the design of this research. As such, this chapter outlines the methodological approach that was undertaken in this study. This chapter reviews the qualitative case study method, outlining the participants, to support how the data was collected and analysed (Merriam & Tisdell, 2016; Stake, 2005). It will then address how the study aligned with ethical considerations, before explaining how data will be organised and presented in the following chapters.

4.2. Overarching Philosophy

This section introduces the epistemological and ontological views held by the researcher that influenced the research design and methods (Creswell, 2013). As outlined in the introduction, in addition to being a researcher, I am a qualified advisory teacher. I have also had experience as a teacher and deputy principal in schools with students with blindness and low vision. More recently, I have lived experience as a parent of a child with legal blindness and as an educator in higher education. Thus, I have worked with many students with blindness and low vision, their teachers and families.

While working in this area, I noted many inequities in students' experiences with blindness and low vision. I noted that the voices of students and their supporters were largely missing from the current body of research. Hence, I sought to ensure students and stakeholders were given a voice to share their experiences. At the same time, it was important that I reflected on any possible bias throughout the research process to ensure credibility and validity (Lichtman, 2013).

My epistemological and ontological views are based on social constructivist beliefs and have been shaped through my prior experience (Crotty, 1998). Social constructivism, a theory of knowledge founded on the work of Vygotsky (1978), was "based on the belief that learning is a result of our social and cultural influences and processes" (Charles, 2018, pp. 287–288). The theory is concerned with the interdependence of the individual and society and often examined how "culturally specific institutions, such as schools, homes, and libraries, systematically structure the interactions that occurred between people, or between people and cultural artefacts, such as books or computers (Minick et al., 1993, p. 6). Socio-constructed research acknowledged the individual agency and decision-making within such spaces (Thorne, 2005). As such, social constructivism was employed in this study as a philosophy to "seek understanding of the world in which they live and work" (Creswell, 2013, p. 6).

The origins of constructivist theories began in social sciences and humanities (Scott & Palincsar, 2009). Social constructivism is a useful framework for understanding learning and teaching (Charles, 2018). When viewed as societies, schools and institutions support learning as derived from the processes that occurred within the ecosystem, for example, teacher and peers (Barak & Barak, 2017). Bandura (2005) contended it was not solely the interactions between others that influenced learning but also how the learner behaved and interacted within the expectations of others. More recently, social constructivism has led to teaching philosophies based on student-centred learning, and inquiry-based pedagogy (Charles, 2018), and technology-driven instruction (Barak & Barak, 2017). Unlike traditional instructional methods, whereby teachers imparted information to students, social constructivist theories in the education discipline posited that students developed their ideas and meanings through opportunities and interactions within their environment (Scott & Palincsar, 2009). The social constructivist view had significance in this study as it underpinned my philosophy when selecting the methodological approach, interacting with participants, and evaluating the data. It was important for me to give voice to the stakeholders as I sought to make meaning from their stories.

Social constructivism acknowledged that "schools and classrooms play a pivotal role in mediating sociocultural, economic and political change; they also reflect geopolitical power relations and demographic shifts" (Rassool, 2009, p. 126). This was particularly true for the education of students with disabilities. Following the ratification of the United Nations (2006) *Convention of the Rights of Persons with Disabilities*, a policy that provided full and equal rights to people with disabilities, schools have been mandated to provide inclusive learning environments. Inclusion has meant that each learner should have teaching and learning goals matched to their individual needs to participate in learning (AITSL, 2016). Inclusive practice brought about changes in attitudes over time as diversity became more common in mainstream classrooms and accepted that differences between people were an "ordinary aspect of human development" (Florian & Kershner, 2009, p. 174).

Within disability fields, social constructivist theorists contend that a person was not disabled by their impairment, but through the systems, processes and the interplay of these in their environment. Shakespeare (2009) described these as intrinsic, contextual and external factors:

> Among the intrinsic factors are: the nature and severity of her impairment, her own attitudes to it, her personal qualities and abilities and her personality. Among the contextual factors are: the attitudes and reactions of others, the extent to which the environment is enabling or disabling, and wider cultural, social and economic issues relevant to disability in that society (p. 185).

For students with blindness and low vision, despite their medical diagnosis, other characteristics (such as persistence and resilience) may influence their ability to learn (Silveira & Cantle Moore, 2018).

The social constructivist theories aligned with Bronfenbrenner & Morris' (2005) Bioecological Systems Model which could provide a conceptual framework for planning research. For example the BSM sought to understand the factors which impacted developmental outcomes, by examining individual, social, and environmental influences. The BSM provided a framework which identified participants within the ecosystem to be interviewed and give voice to different perspectives in relation to students with blindness or low vision in mainstream secondary schools.

My desire to hear the perspectives of stakeholders was to gather an holistic understanding of people who influenced and were influenced by students with blindness and low vision in the ecosystem. Holding a relativist ontology with an interpretive lens (Sokolowski, 2000), I also believe that norms and values were created by society and culture. Therefore, these stakeholders were important voices in understanding students' experiences and ensuring they were part of the solution (Rashid et al., 2019). However, it is also recognised in these philosophical approaches that my personal views could influence the interpretation of the participants' stories (Wadey & Day, 2018). Consequently, the research design included additional measures to minimise bias. These included study design to reduce selection bias, interview protocols to minimise interviewer bias, and member checking to moderate bias in data analysis (Pannucci & Wilkins, 2010). These strategies will be expanded on throughout the following sections.

4.3. Methodological Approach

Earlier studies in blindness and low vision often employed quantitative methods to understand experiences or the Quality of Life (QoL) for people with blindness and low vision (de Boer et al., 2004). Historically, quantitative research was viewed as more reliable due to an ability to control bias and replicate the findings leading to a belief that research involving quantitative data was more credible (Creswell, 2013; Creswell & Plano Clark, 2018). de Boer et al. (2004) undertook a systematic review which revealed a total of 31 questionnaires that focused on the QoL for people with vision impairment.

Other studies have aimed to contextualise QoL for the specific social needs of the country such as Australia (Misajon et al., 2005), India (Nirmalan et al., 2005), Italy (Rulli et al., 2018), Thailand (Ratanasukon et al., 2016) and the United Kingdom (Bokhary et al., 2013; Rahi et al., 2009; Thurston et al., 2010).

Further research by Bokhary et al. (2013), and Chadha and Subramanian (2010), demonstrated how quantitative approaches were utilised to adapt tools to measure QoL for children through the creation of paediatric scales. Datta and Talukdar (2016) developed a *Self-Concept Scale* to measure the self-concept of 25 youth with blindness and low vision and found the majority had a low self-concept. A similar inventory, examining participation for children, youth, and young adults with blindness and low vision, was developed by Elsman et al. (2017). Within Australia, Jessup et al. (2017) used quantitative studies to examine the social experiences of high school students with blindness and low vision using a Psychological Sense of School Membership tool as a measure of inclusion. While other researchers (cf Shaw et al., 2007; Wolffe & Kelly, 2011) have utilised secondary data, such as the *National Longitudinal Transition Study* to explore employment and student transition outcomes for students with blindness and low vision.

While these quantitative studies have provided important information, other studies also used qualitative approaches to gain in-depth data about participant experiences, strengthen research and triangulate data (Creswell, 2013; Creswell & Plano Clark, 2018). For example, in the field of blindness and low vision, Cochrane et al. (2011) researched students aged 8–18, with blindness or low vision, using a standardised paediatric QoL questionnaire along with focus groups to understand participation in everyday school activities. Similarly, Crossland et al. (2017) adopted a standardised QoL questionnaire and semi-structured interviews to understand the benefits of electronic tablets for people with blindness and low vision. Other researchers used observations to examine the adequacy of the classroom, along with quantitative questionnaires, including a standardised *Quality of Inclusive Experiences Measure* (Brown et al., 2011). A questionnaire was applied by Zebehazy (2014), with a mixture of likert-type scale questions for quantitative data, along with open-ended questions that were coded and put into themes to describe literacy for students with blindness and low vision and cognitive disabilities. These studies found that qualitative methods provided rich, empirical data to make meaning of their participant's situations. Hence qualitative interviews were deemed useful for this study as they provided the potential to aid a rich understanding of the complex processes that impacted these students' experiences.

Case studies have been commonly used in educational contexts to examine elements of a specific situation in relation to its applicability to other situations. According to Cohen, Manion and Morrison (2007), "case studies investigate and report the complex dynamic and unfolding interactions of events, human relationships and other factors in a unique instance" (p. 253). Within a case study, specific individuals, or groups of people, are examined in-depth for a particular period of time (Leedy & Ormrod, 2013). Case studies have been used in research of students with blindness and low vision to examine the impact of online learning, the use of braille, and the impact for mothers having a children with blindness and low vision. Wu (2018) used case study to understand the impact of online learning, specifically looking at attributes of the learner and support available to them. Rosenblum and Herzberg (2020) utilised qualitative case study methodology to examine four adolescents who used braille, their teachers and family members. Longitudinal case study methodology was also used by Cain and Fanshawe (2021) for the method's ability to investigate the lived experience of the participants, who were mothers of children with blindness. Case studies explored phenomena allowing an in-depth understanding of participants and their situations.

When considering inclusion, specifically secondary students with blindness and low vision, it is necessary to understand the wider context in which they participate. Qualitative case studies were most suited to these studies to provide this group a voice in the research. Case studies supported a rich understanding of the contexts in which these students learn (Brantlinger et al., 2005). Therefore, case studies were selected to align with the researcher's aforementioned philosophies and the Bioecological Systems Model

(Bronfenbrenner & Morris, 2005) as outlined in the conceptual framework chapter.

4.3.1. Case Study Method

Case study method focused on understanding participants' views within a complex ecosystem. Using a constructivist case study methodological approach (Stake, 2005) enabled the researcher to gather important information. Each of these groups had opinions, artefacts, viewpoints, and past experience that would enable decision-making and inform future practices and curriculum development (Aaltio & Heilmann, 2010). Specifically, for the study of students with blindness and low vision in the educational context, the case study approach could support policy-makers in making informed decisions about practice (Timmons & Cairns, 2010, p. 2).

Scholarly literature evidenced two schools of thought about the usefulness of case study as a qualitative method in research. A positivistic philosophical view held by Yin (2012), used a case study approach to focus on establishing facts (Crotty, 1998). The researcher's role is to construct reliability and validity through an objective lens (Yin, 2013). A constructivist approach to case study, presented by Stake (1995), posited that the intention of case study methodology was to search for a "social construction of reality" (Carter, 2020, p. 303). This was supported by collecting evidence, which may have been structured or unstructured, with individuals or groups, but carefully selected and interpreted to allow the researchers to attempt to understand the participant's views (Stake, 2005). In a group or collective case study, "inquiry is derived from multiple cases to illustrate the phenomenon" (Colburn, 2019). As such, this study used Stake's (2005) *Multiple Case Study Data Analysis* approach. The perspectives of multiple stakeholders was important to gain an holistic understanding of the students' experiences in mainstream secondary schools.

Case study methodology is a prominent type of qualitative research. However, there has been debate over whether case study is an "approach, a method, a methodology or a design" (Carter, 2020, p. 301). Timmons and

Cairns (2010) proposed that case study was a way of performing qualitative research that was both flexible and complex and can therefore be all of these. For example, case study can be flexible in its ability to research just one singular case, a large number of cases, or a collective case study involving a group of people who represent one case. Case study is also complex as it allows the researcher to gather data to gain a full picture which may inform future decision-making and policy change (Timmons & Cairns, 2010). Stake (1995) similarly noted the flexibility of case study and proposed it allowed researchers to study the phenomena in a social context. Case studies could be designed to include stakeholders who were deemed important by the individuals in the centre of the ecosystem.

Case study was a useful tool in complex areas, such as studies of students with disabilities and inclusive education. It enabled the researcher to gather the “rich holistic data that contribute to the understanding of complex situations” (Timmons & Cairns, 2010, p. 2). In this study, a collective case study approach was used to examine the perspectives of many participants and allowed for a greater understanding of the system than a single perspective (Creswell, 2013; Onwuegbuzie et al., 2013). Multiple, collective case studies were something yet to be explored for students with blindness and low vision in mainstream schools.

4.4. Research Design

An Interactive Model of Research Design (Maxwell, 2013) was employed to support the approach in designing the research. Maxwell (2013) asserted that the flexibility and complexity within a qualitative case study approach, could make it difficult for researchers to plan goals and methods that ensured validity. As such, Maxwell (2013) proposed the use of *An Interactive Model of Research Design*. The model aimed to assist the researcher in designing logical research aligned to the context and the project. The model consisted of five interwoven components: method, goals, conceptual framework, research questions and validity, which were non-linear and dynamic (Carter, 2020). These were employed in this study as a systematic method to design the research and minimise researcher bias. The following section will outline the use of *An Interactive Model of Research Design* (Maxwell, 2013) to design this study, as shown in Figure 4.1.

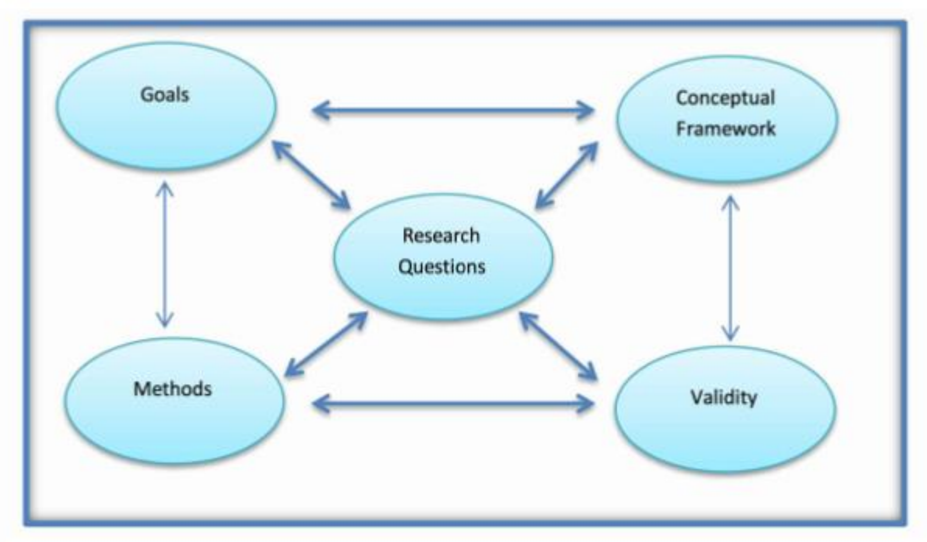

Figure 4.1 An Interactive Model of Research Design (Maxwell, 2013)

4.4.1. Goals

Maxwell (2013) asserted that well-designed studies contained both practical and intellectual goals. Practical goals were "focused on accomplishing something—meeting some need, changing some situation, or achieving some goal" (p. 220), and intellectual goals "focused on understanding something" (p. 220). Therefore, the following goals were identified for the current study:

- Practical goal: to increase employability of people with blindness and low vision.
- Intellectual research goal: to gain an understanding of the barriers and enablers to participation in learning and future employability for students with blindness and low vision in mainstream secondary schools.

4.4.2. Framing the Study

The research questions were considered central in framing the study design as they: guided the research design of the study, connected the components of the research, and presented the findings as the product of the study (Maxwell, 2013). The research questions in this study aligned with the practical and intellectual goals. The research questions were:

- What do a range of stakeholders perceive enables and/or inhibits access for secondary students with blindness and low vision, in relation to participation in learning and future employability?
- How do the findings from these perspectives relate to the Bioecological Systems Model in identifying barriers for students with blindness and low vision? and
- What are the implications of this knowledge, for future employability and practice, for educators?

4.4.3. Addressing Researcher Bias

All researchers bring prior knowledge to a study through their own personal experience and immersion in the literature (Maxwell, 2013). Due to the multiple perspectives I brought as a researcher, educator, and parent to this study, it was essential that additional consideration of the research design was required to ensure researcher bias was controlled. Researcher bias was addressed through careful design of the planning, implementation, and analysis of the research. Fundamentally, the desire to minimise researcher bias was also due to my immersion in educational environments and passion for supporting students with disabilities. In using an interpretivism paradigm, whereby my role was to understand how meaning is created for the participants rather than impose meaning on the data, I was able to minimise the influence of my own perspectives on the experience of blind and low vision students in secondary schools. This was one by using the words, or the voice of the participants in the data chapters, and I acknowledge my role in ensuring their meaning was authentic. For example, planning the research design required me to consider any potential bias in the selection of participants. Kitchen et al. (2019) believed that carrying out an initial mapping of participants can provide an opportunity to recognise bias. Therefore, careful consideration of the study design was made when selecting participants by following Maxwell's (2005) *An Interactive Model of Research Design*. I also followed guidelines in the literature for purposeful and criterion sampling (Leedy & Ormrod, 2013; Palinkas et al., 2015). These strategies are outlined in Section 4.5.3.

Interviews were used to gather empirical data and make meanings of the participants' views and experiences through conversations (Creswell, 2013). Pannucci and Wilkins (2010) warned that all researchers must design and undertake research in a manner that reduced prejudice. As such interview questions were carefully worded and informed by the scholarly literature. Approval for the questions were gained through the University of Southern Queensland Human Research Ethics Committee. The questions were designed to allow stakeholders to share their opinions, and an environment was established that was free from judgment (Cohen et al., 2007; Creswell, 2013). A safe environment allowed participants to feel comfortable presenting their positive and negative views to enable a full understanding of the ecosystem being explored (Rothery, 2016). These strategies are outlined in Section 4.5.4.

Member checking was also used to ensure that the participant's voice was recorded as they intended (Birt et al., 2016). Following interview transcription, participants were sent a copy of the transcript and asked to reply with any changes if required. The data were then analysed through NVivo. Maher et al. (2018) believed NVivo and similar programs reduce researcher bias by providing rigorous data analysis systems. Finally, when presenting the data findings and discussion, I again acknowledged my own position within the research. I attempted to negate this by focusing on the participants and using their voice to tell a story (Creswell, 2013). These strategies are outlined in Section 4.5.4. These philosophical views, concepts and approaches (Appendix A) have attempted to create a rigorous research design to minimise researcher bias.

4.5. Methods

This section outlines the methods undertaken within the study, in line with *An Interactive Model of Research Design* (Maxwell, 2013). The methods included a) research contexts, b) participants, c) recruitment, d) data collection, and e) data analysis. The procedures undertaken in data collection, analyses and the proposed presentation of the data are explained.

4.5.1. Research Context

This qualitative research was conducted over a number of stages in 2020 and 2021 within Queensland, Australia, after ethical approval was received. Although some of the initial data collection was able to be conducted in person, data collection methods were modified in March 2020 due to travel restrictions enforced by COVID-19. As a result, most of this research was undertaken through online teleconferencing, namely Zoom, Microsoft Teams, and telephone.

4.5.2. Participants

The students central to the study were six students in secondary, mainstream education with blindness and low vision. These students have been provided with a non-gendered pseudonym to protect anonymity. All students were educated in mainstream schools and formally diagnosed by a medical professional with blindness or low vision. In this study the students' vision is reported as complete blindness (with no light perception), such as Sam, legally blind (vision of worse than 6/60) such has Jo, Kye, and Jaime, and low vision (vision worse than 6/18) (WHO, 2018), such as Chris and Charlie.

It should be noted that gender-neutral pseudonyms and language have been selected to increase anonymity and personal pronouns for the students throughout are they/them, not he/she, her/his (American Psychological

Association [APA], 2019). Anonymity is important given the low incidence of blindness and low vision in the geographical area of this study and the potential to identify students by grade and gender. Given that the students are central to this research, a brief introduction to each student is provided.

4.5.2.1. Introducing Sam

Sam is in Year 10 and has complete congenital blindness. Sam attended a mainstream school in a metropolitan location, with other students with blindness and low vision. They lived at home with their parents and older sibling. Sam used a cane, echolocation, and applications for mobility and access print through iPhone, IPad, laptop and electronic braille devices. Sam accessed the iPad with a screen reader, Job Access With Speech (JAWS), and used the inbuilt technology of VoiceOver on Apple products. Sam explained that the school data communication system of OneNote is not accessible with their JAWs screen reader. Hence, the support teacher converts all documents in OneNote to word documents prior to the beginning of the school week. Sam reported feeling confident in using technology, particularly Apple products, given they had been using an iPad since primary school. However, Sam alleged there is always something to learn. Sam thought their school provided good support, particularly as Sam received a spare subject line, which comprised of three lessons a week to study and complete homework. Sam also received individual specialised braille maths lessons from the support teacher in this time, using custom-made braille blocks to provide a tactile experience for more abstract concepts, such as algebra.

4.5.2.2. Introducing Jo

Jo is in Year 11, is legally blind, has a coexisting diagnosis of autism, and had a moderate hearing impairment from birth. Jo lived with their mother in a metropolitan area and attended a mainstream school. Jo used a cane for mobility, an iPad for social communication, and the screen reader JAWS on the laptop as the primary means of access. Jo also had an electronic braille device attached to the laptop but complained that it did not always work well. Jo enjoyed watching YouTube videos with audio description. Jo shared that they used headphones to amplify the sound. Jo shared in the interview, the school which they attended provided most of the communication through OneNote. They reported that OneNote was not accessible with the software program of JAWS, so teachers emailed the work in word documents at the beginning of the week. Jo relied on voice, dictation, and audio listening through headphones and had a device that amplified the teacher's voice in the classroom. Jo explained this was particularly useful "if you're in a specific class like Chinese and you've got to really listen to the tone of the teacher speaking another language."

4.5.2.3. Introducing Chris

Chris was in Year 11 and had central vision loss diagnosed at 10 years of age, which has left them with low vision. Chris did not use mobility aids, such as a cane or a dog. They lived at home with their parents, who were both educators. In 2020, during Covid, Chris reported they completed school through distance education as they did not feel comfortable attending on campus but returned to mainstream school in 2021. Chris said they used a Mac computer and iPhone to access the curriculum and preferred lesson content to be emailed prior to the start of every lesson. Chris reported that most students use computers in the classroom, but they preferred to sit at the back of the room rather than the front as they were self-conscious of how much they had to magnify the screen. Chris informed magnification was their preferred modification to access work, but at times would use a screen reader, mainly when there was a large amount of text, such as in psychology. During home-schooling they asked their mother to read out content-dense information or an image or a copy of the text that was difficult to magnify. Chris stated they were quite good at touch typing and used shortcuts to switch tabs, windows, and split screens.

4.5.2.4. Introducing Kye

Kye was legally blind. They were educated in a Catholic co-educational school and were legally blind from birth, using a cane for mobility. Kye shared their home in a capital city with their parents and siblings. Kye reported being very advanced in technology because they have been taught how to use it and used it all their life. Kye predominately used Apple products to access the curriculum, specifically an iPad Pro with AirPods, which worked well with the inbuilt screen reader, Voiceover. They also used a Focus 40 electronic braille machine which worked with their iPhone, iPad, and Apple watch. Kye also expressed wanting to work at the Apple store as a part-time job. According to Kye, classroom teachers uploaded class notes, readings, and handouts digitally in an accessible online portal. Kye reported that classroom teachers used thick pens, which allowed Kye to take a photo on the iPad pro and enlarge the image through magnification. Kye also used the camera for taking photos of things in science, such as the beakers, which could then be magnified to see the image.

4.5.2.5. Introducing Jaime

Jaime was in Year 11 in a rural area. They lived at home with their parent and sibling and used a cane for mobility. They attended a local Government school and have chosen psychology and maths subjects in secondary. Although legally blind, Jaime informed they preferred to use magnification and screen readers instead of braille, except for braille music. Like Chris, Jaime described psychology as having a significant content of reading which they accessed through a laptop through JAWS screen reader. Jaime stated they used an iPad with an external keyboard or an Apple pen to input notes in class. Jaime said they received extra time in exams and assignments, and all class teachers appeared quick to make modifications by reading out what they were writing on the board. Jaime felt pretty confident with technology and said they had enough technology to access learning at school. Jaime said that they had been using technology for years, so they were used to it. They first remembered learning how to use these tools at the age of 6. They have received weekly lessons with an Assistive Technology specialist to learn the necessary skills to access the curriculum.

4.5.2.6. Introducing Charlie

Charlie had low vision and is in Year 9, in an Independent elite school, well known for supporting curriculum access of their students. Charlie lived at home with their parent and siblings in a capital city. Charlie reported that the school had a Curriculum Access Hub responsible for ensuring participation for students with learning needs and disabilities. Charlie said that when they began at the school, they had a meeting with the administrators and explained how they worked best for their severe low vision, usually digital information being emailed or in OneNote to enable independent access. Charlie shared that they used an iPad Pro with Voiceover in the classroom and a laptop with Microsoft Magnifier and a large monitor at home. They related that the iPad Pro enabled them to magnify sufficiently at school where the monitor was not portable. Charlie informed provisions such as additional time for exams and formatting changes and digital test papers also assisted accessibility. Charlie preferred to use mainstream devices rather than specialised low vision equipment. Charlie said as an example, the inbuilt screen magnifier on the iPad and laptop provided everything they needed, so there was no need to install blindness-specific software, as with using the inbuilt magnifier, they had access to any computer.

4.5.2.7. Introducing the Other Stakeholders

This study aimed to examine students' experiences with blindness and low vision with a social constructivist view. Therefore, the perspective of other stakeholders within the ecosystem was considered essential by the researcher to understand the education and employment contexts. In 2019, scoping research (Ethics approval: H18REA275) was undertaken with students with blindness and low vision in mainstream secondary schools, parents, and teachers. Students were asked to identify people who supported their learning (Cain & Fanshawe, 2019a, 2020, 2021). They identified classroom teachers, parents, aides, support teachers, advisory teachers, orientation and mobility therapists, and assistive technology specialists. Other stakeholders were also selected to gain a more holistic understanding of blindness and low vision and its impact on education and employment. Additional stakeholders included people with lived experience of education and employment, policy-makers and disability consultants/employers (see Table 4.1 and Table 4.2).

Table 4.1 Participants' Demographics

Characteristic / Participant groups	Gender		Level of vision/of their child			Impairment/of their child		Location	
	M	F	Low vision	Legally blind	Totally blind	Congenital	Acquired	Metro	Regional /rural
Students	2	4	2	3	1	5	1	5	1
Parents	2	4	2	3	1	5	1	5	1
People with Lived Experience	2	2	1	2	1	3	1	3	1
Teaching Staff	3	3						4	2
Advisory Teachers /Therapists	2	4						4	2
Policy-Makers	1	3						4	0
Employment Consultant/ Employers	1	3						4	0

Table 4.2 Participant Groups

Groups (36)	Participants
Students (6)	Sam, Jo, Chris, Kye, Jaime, Charlie
Parents (6)	Louisa, Millie, Natalie, Amanda, Simon, Andrew
People With Lived Experience (4)	Emily, Paul, Dianne, Yvel
Teaching Staff (6)	Lisa, Kate, Nic, John, Toni, Luke
Advisory Teachers/Therapists (6)	Sarah, Carole, Terence, Cliff, Barbara, Heather
Policy-Makers (4)	Pam, Nabel, Monique, Jorge
Employment Consultant/ Employers (4)	Thomas, Susie, Olivia, Ta

4.5.3. Recruitment

Careful sampling of participants was essential within a case study to enable the researcher to make generalisations that would support external validity to represent larger populations (O'Dwyer & Bernauer, 2014). Therefore this study was guided by Cohen et al. (2007), who suggested four key factors for selecting participants: a) sample size, b) representativeness, c) access to the sample, and d) the sampling strategy to be utilised.

4.5.3.1. Sample Size

This study used a case study approach, whereby similar stakeholders were researched as a collective group. Participants in the centre of the ecosystem were students with blindness and low vision in secondary mainstream schools. As outlined in the literature review, there were approximately 4000 students throughout Australia (Opie, 2018a). With only a fraction of these in secondary school, the study needed to consider anonymity. To maintain confidentiality, names of locations and schools were removed, and any identifying information that the participants provided. Pseudonyms were provided for all participants to maintain anonymity (APA, 2019).

Mainstream schooling provided an education facility that enrolled both students with disabilities and those without. In Australia, students with blindness and low vision were generally educated in a mainstream school, unless they had co-morbid intellectual impairment. In which case, the student may attend a special school (Cain & Fanshawe, 2020). This study chose to focus on secondary education due to the ability of students to articulate their educational preferences and what worked for them within education systems. Students within the study were within Years 9 to 12 (Opie & Southcott, 2015).

In terms of sample size, Creswell's (2013) process did not define a specific number of participants, instead prompted the researcher to ensure external validity. To establish a suitable number, the researcher looked to the methodology of developing the Australian National Curriculum. In the early curriculum shaping stage of the curriculum redesign, the Australian

Curriculum sought “targeted consultation with key stakeholders including teachers and schools, state and territory education authorities, parents and students, professional associations, teacher unions, universities and industry and community groups” (ACARA, 2012, p. 6). The 9797 stakeholders provided thoughts, opinions, and a broad direction of the curriculum redevelopment for 3,798,226 Australian students (ACARA, 2009). Numbers were based on an estimation of 4,000 students with blindness or low vision, studying in mainstream schools in secondary within Australia (Opie, 2018a). However, using the proportions of the above sample size would only have resulted in 10.32 participants and would lack external validity. The research was therein designed to include 36 participants (Figure 4.2), four to six participants of each stakeholder group within the ecosystem. The representativeness of the sample was then explored (Cohen et al., 2007).

The Australian Curriculum: Participants

N = 9797 (0.0025 of 3,798,226 students)

This Study: Participants

N = 36 (0.009 of 4,000 students)

Figure 4.2 Participant Sample Size

4.5.3.2. Representativeness

The representativeness of sample was particularly important to ensure a generalisation of enablers and inhibiters across education contexts (Cohen et al., 2007). Stakeholders were identified by asking students in the initial scoping interviews “Are there people who support your learning?" Additionally, an analysis of who was within the ecosystem was undertaken, using Bronfenbrenner’s Bioecological Systems Model, outlined in Chapter 3 to map out stakeholder groups who influenced students with blindness and low vision. The participants are represented in Tables 4.1 and 4.2:

- Individual level: students who were blind or have low vision in mainstream secondary schools,

- Microsystem: peers, families, and teachers were identified (however, peers were removed due to ethical consideration),
- Mesosystem: advisory teachers and therapists interactions who interact with students, families, teaching staff, and policy-makers,
- Exosystem: policy-makers such as managers of Statewide Vision Services and external disability organisations who make decisions about resourcing,
- Macrosystem: employment consultants and human relations consultants who recruit employees, and
- Chronosystem: people with lived experience of blindness and low vision who have experienced education and employment at different times.

Including people with lived experience as a case study has been posited as valuable in qualitative research to provide the researcher greater insight into participant experience (Lewis & Hasking, 2019). In a study by Riach and Loretto (2009), the authors gave voice to the lived experience of older people with disabilities who had been unemployed. These participants provided valuable insights into the barriers to employment, which the researcher could apply to the research group and make further generalisations. Similarly, Moreno et al. (2018), included people with lived experience to have a voice in the study of cyberbullying in education, through purposeful criterion recruitment of adults who had a similar experience as the participants. Therefore it was considered valuable to include the perspectives of people with lived experience who had transitioned from education to employment over different periods of time.

4.5.3.3. Access to the Sample

The inclusion of participants with expertise and knowledge in the area was claimed to provide richer data which increased external validity while assisting the researcher to construct meaning (Rubin & Rubin, 2005). However, this also had to be balanced with having access to the participants

(Cohen et al., 2007). As participants were located throughout different geographical areas, coupled with travel restrictions due to COVID-19 in 2020, teleconferencing was the preferred method of contact.

4.5.3.4. Sampling Strategy

Purposeful sampling involved intentionally selecting individuals who had knowledge or experience of the phenomena being investigated (Creswell & Plano Clark, 2018), along with the willingness and ability to participate (Bernard, 2011). "Purposeful sampling is widely used in qualitative research for the identification and selection of information-rich cases for the most effective use of limited resources" (Palinkas et al., 2015, p. 534). This strategy used specific, purposeful sampling strategies within the case studies, including criterion sampling (Figure 4.3). Criterion sampling involved the identification of specific criteria that a participant must possess to be included. In this study, criterion sampling assisted the researcher to generalise the findings "to make comparisons, build theory, or propose generalizations" (Leedy & Ormrod, 2013, p. 141).

Individuals	a) student in secondary AND b) attend a mainstream school AND c) formal diagnosis of blindness or low vision (see glossary)
Parents	parent of a student interviewed in the individual case study
Teaching staff	a) classroom teacher OR b) support teacher OR c) teacher's aide AND d) taught or provided support specifically for student/s with blindness or low vision within a mainstream school
Advisory teachers and therapists	a) employed as a specialist teacher OR b) a therapist AND c) provided expert advice specifically for student/s with blindness or low vision within a mainstream school
Policy-makers	a) managers of a Statewide Vision Service OR b) managers of disability organisations AND c) responsible for decisions of resourcing for students with blindness and low vision
Employee consultants and employers	a) employed as a disability employee consultant AND b) has provided expert advice specifically for student/s with blindness or low vision within a mainstream school OR c) responsible for hiring people within their organisation
People with lived experiences	a) person with blindness or low vision AND b) was blind or had low vision in secondary AND c) had been in full time employment

Figure 4.3 Selection Criterion: Participants by Case Study Group

4.5.3.5. Recruitment

Prior to the recruitment of participants, this study was approved by the University of Southern Queensland Human Research Ethics Committee (H18REA275 and H20REA124). Participant information sheets were created in accessible formats, stating the research aims, the participants expected commitment. They included consent forms to be signed by the participant or the participant's parent or caregiver if under 18 years of age. Information sheets were provided to recruit participants through the following means:

- Students and parents: local blindness-specific organisations sent invitations through email to potential participants.
- Teaching staff: were gained through previously known research participants or directly through one school, with approval from the Education Department and the Human Ethics Committee. Potential participants were emailed with invitations.
- Advisory teachers and therapists: with the assistance of local blindness-specific organisations, the research was advertised to advisory teachers/therapists
- Policy-makers: direct recruitment was conducted through emailing managers of Statewide Vision Services and blindness-specific organisations.
- Employee consultants and employers: direct recruitment was employed through emailing blindness-specific organisations and contacting employers.
- People with lived experience of blindness and low vision: with the assistance of local blindness-specific organisations, potential participants were emailed with invitations.

Upon agreement to be involved in research, participants were provided with participant information sheets and provided an opportunity to ask questions prior to agreeing to be interviewed. It is noted, that one parent agreed to be interviewed, but due to ill health, was unable to be involved.

4.5.4. Data Collection

Data was collected over 2020 and 2021 through 36 interviews, either face-to-face, videoconferencing, or telephone conversations. Methods were selected to enable the participants to provide new meaning (Somekh & Lewin, 2005). Using interviews was supported as a common means of data collection. Hochschild (2009) argued that the inclusion of interviews was more authentic than quantitative methods. It allowed for increased validity when interpreting data, as the researcher was able to gain meaning directly from the source.

Online interviews were recorded using Zoom for videoconferencing, and saved to the researcher’s computer. Alternatively, VoiceMemos on Apple iPhone were used and then uploaded into Panopto, a program that can manage multimedia files and automatically transcribe the audio content.

4.5.5. Data Analysis

Once the data was collected, the next step was the process of making meaning from what was seen and heard (Merriam & Tisdell, 2016, p. 172). Cohen (2007) stated that the ultimate goal of the analysis was to reveal the participant’s outlook of the phenomena. In this study, the research goal was to understand the barriers and enablers to participation in learning and future employability for students with blindness and low vision in mainstream secondary schools.

The data analysis strategy was also based on Stake’s (2005) *Multiple Case Study Analysis* approach. Stake (2005) recognised this need for clarity and rigour in the analysis of multiple case studies and proposed three steps to work with multiple case study data: Step 1) emphasise case findings, Step 2) merge case findings, and Step 3) make cross-case assertions.

4.5.5.1. Step 1: Emphasising Case Findings

Stake (2005) believed that it was important for the researcher to immerse themselves in the data when analysing multiple case studies. The transcriptions for each case were initially treated individually. The transcriptions were edited while listening to the recordings of participants' voices. At the same time, notes were made, and themes were reflected on after each transcript (Byrnes & Rickards, 2011). According to Glesne and Peshkin (1992), reflecting on the data collected, allowed the researcher to start thinking about the meaning data was trying to share, and capture analytic thoughts throughout the data collection phase.

Within this study, seven collective cases were analysed, which each had 4 to 6 participants. Once edited, the transcribed responses were imported into the data analysis program NVivo (QSR International, 2012). The benefit of NVivo was the ability to upload files from different sources, organise the data into cases, code the data into themes and present the data (QSR International, 2012). Maher et al. (2018) asserted that the use of digital analysis packages such as NVivo, also added rigour to the research due to the inbuilt "data management and retrieval facilities" (p. 1), which the researcher found useful to avoid duplicate coding. Another benefit of NVivo was the ability to define cases, which was useful in Stake's (2005) next stage of merging case findings in a multiple case study methodology.

Inductive category development was employed to theme data from the participant interviews (Mayring, 2000). This involved the creation of tentative themes of a) systems, b) technology and c) individual (see Appendix B). Formative checks on the emerging data set was then undertaken to review themes and formulate new categories. As an inductive method has been criticised for the possibility of research bias (see Creswell, 2013), the researcher used NVivo to search for common words and themes using the word search and word frequency tools and compared to the notes and themes taken while editing the transcriptions. As each case study's data was analysed into themes in NVivo, both the number of respondents (how many participants commented) and the number of references (how many comments) were collected. These were used to examine the frequency of responses for each stakeholder group (Appendix C). Themes for each group then emerged, shown by frequency of discussion from the participants. Revisions of themes were made as required, and the final working-through of interview data resulted in a summative check of the reliability of the themes for each case study (Appendix D) (Mayring, 2000).

4.5.5.2. Step 2: Merging Case Findings

Following creation of themes for each case, Stake (2005) recommended analysis across cases (thematic synthesis) to identify similar themes or patterns occurring across the cases. In this step, themes were analysed that were specific to one stakeholder group, or common across all of the groups, to help understand the significance of the themes in relation to the research questions. NVivo was used to examine the main themes for each case study group and used the data in cross-case analysis to examine the frequency of responses.

4.5.5.3. Step 3: Finding Factors for Analysis to Make Cross-Case Assertions.

The final step in Stake's (2005) process was to begin to make naturalistic generalisations from the data as a whole. This phase involved the researcher immersing themselves in the data as an entity, understanding and interpreting how the methods and data collection as a whole to answer the research questions:

- What do a range of stakeholders perceive enables and/or inhibits access for secondary students with blindness and low vision, in relation to participation in learning and future employability?
- How do the findings from these perspectives relate to the Bioecological Systems Model in identifying barriers for students with blindness and low vision? and

- What are the implications of this knowledge, for future employability and practice, for educators?

4.6. Validity

As qualitative methodology was based on an interpretation of assumptions of the participant's reality made by the researcher, the research itself would not always gain trustworthiness and rigour implicit in quantitative studies (Merriam & Tisdell, 2016). Therefore, ensuring evidence of validity in the research meant increasing the reliability and ethical considerations within the design, both internally and externally. Merriam and Tisdell (2016) explained internal validity was the credibility of the research, ensuring that the findings represented the participant's meaning and external validity was the credibility and transferability of the research in other situations.

4.6.1. Internal Validity

An important part of creating internal validity was the ethical considerations that guided the research (Glesne & Peshkin, 1992). As part of their commitment to human research, researchers have an ethical responsibility to protect the participant's safety, to anonymise data, and tell the story with the participant's intent (Brown, 2019). In this study, ethical obligations were considered through completing human research ethics applications to begin the study, which focused attention on processes required to protect participants. This was achieved by creating participant information sheets and consent forms. Individuals were made aware that although they would remain anonymous and would be provided with a pseudonym, they might have been potentially identifiable due to the small community of stakeholders. However, to minimise this risk, locations and organisations would be removed to minimise this risk. Post consent, all participants had the ability and right to withdraw from the research at any time without explanation until the data was de-identified. Within interviews, participants' right to confidentiality was maintained by conducting interviews without others present at a place that suited the participant or via Zoom. Voice recording was used as well as researcher notes which were transcribed and used for analysis.

The research design also acted as a critical part of internal validity to reduce researcher bias which included: how participants were sampled, the instruments chosen for data collection, and how the data was interpreted (Merriam & Tisdell, 2016). Stake (2005) proposed the process of triangulation as a method to increase validity. This involved having three different methods, which offered an internal check to ensure that the data aligned. Within this study, the nature of the Bioecological Systems Model (Bronfenbrenner & Morris, 2005) and purposeful sampling strategies were used to ensure triangulation through different perspectives from multiple participants. NVivo was used as a tool to analyse data, which according to Maher et al. (2018) was supported by built-in mechanisms that increased the validity of the analysis.

As identified earlier, it is important to note the role of the researcher in the ecosystem. This is because the researcher brought existing knowledge, reflectivity and methodological approach (Collins & Stockton, 2018). The researcher’s fundamental beliefs, and socio-cultural lens, guided their actions for research and interpretation of the experiences. The researcher’s role was to base their research on theory (Collins & Stockton, 2018) to refine goals, develop questions that were meaningful to the individual’s experience and sought to understand the situation (Maxwell, 2013). Failure to do so could have invalidated the research.

The researcher’s role in interpreting the data was also important in terms of validity. It must assure the interpretation conveyed the participants meaning through “rigorous data gathering and critical review of what is being said” (Stake, 2005, p. 33). Validity in interpretation could be compromised due to the researcher’s perceptions of the participant’s phenomena (Merriam & Tisdell, 2016; Stake, 2005). Lichtman (2013) posited that researchers needed to examine their role in the research to make explicit the role they played in gaining data and reducing researcher bias. Merriam and Tisdell (2016) suggested the researcher continually asked themselves if the results were able to be generalised. Yazan (2015), furthered that researchers should continually ask themselves, throughout the analysis process, if their findings truly reflected what the participant said and meant. In this study, the researcher continually checked on their own positionality within the research and attempted to reflect on data through the eyes of the participant.

Member checking, or providing the participant the interview transcript, was suggested by Stake (2005), to ensure accuracy of meaning and validity in a study (Birt et al., 2016). It was also used in this study to address researcher bias. Iivari (2018) suggested that member checking might also have helped participants to feel empowered by their role in research. In this study, upon completion of the interview the participants were emailed the transcript and requested to check for clarity and meaning. Participants were asked to respond with any changes and again provide consent to use the data in the research (Figure 4.4). For the students with blindness and low vision, an introduction was prepared for each individual, provided in Chapter 5, to prioritise their position in the core of the ecosystem and highlighted the students' unique and diverse abilities. Parents were provided with the draft introduction and all feedback was incorporated into the revisions. Two students asked for gender and year levels to be removed to ensure anonymity. An additional decision was made to present all students as non-gender specific to ensure further anonymity in line with an APA (2019) style approach.

From: #CM

Sent: Wednesday, 4 November 2020 257 PM

To: Melissa Fanshawe <Melissa.Fanshawe@usq.edu.au>

Subject RE: Research agreement

Hi Melissa,

I consent and this looks accurate. Thank you for including me. This is an incredible project and is due to make such a difference.

Kind regards,

Figure 4.4 Member Checking

4.6.2. External Validity

The design of the research should also consider elements of reliability (Maher et al., 2018), or the “extent to which the research findings can be replicated” (Merriam & Tisdell, 2016, p. 210). However, qualitative field work differed to quantitative research, as Tracy (2013, p. 229) explained:

> Socially constructed understandings are always in process and necessarily partial, even if the study were repeated (by the same researcher, in the same manner, in the same context, and with the same participants), the context and participants would have necessarily transformed over time—through aging, learning, or moving on.

As qualitative research may not be replicated, Lincoln and Guba (1985) proposed a more reliable test of external validity in qualitative research is dependability, that is, to check the results make sense, rather than if the result be replicated. Through use of *An Interactive Model of Research Design* (Maxwell, 2013) the researcher continually aspired to ensure validity by checking the result made sense by aligning the goals and processes and seeking to explain the participant’s experiences.

Maher et al. (2018) asserted the reliability of the information, and the trustworthiness of researcher’s interpretation could be gained through the ability to generalise the study. This could be to others within the setting, other cases (Maxwell, 2013), or a broader basis to see how other participants would fit into the same framework (Curtis et al., 2000, p. 1002). However, Timmons and Cairns (2010) warned qualitative researchers to be careful when making generalisations beyond study groups or in other contexts. Onwuegbuzie and Leech (2010) supported that researchers did not need to overgeneralise their findings. Using sound research methods could enable others to replicate the study if it suited their needs. Therefore by providing an analytical approach (as shown in Appendix A) and detailed methods throughout this chapter, the researcher enabled others to make generalisations, if the study fit their context.

4.7. Summary

The researcher's interpretivist paradigm influenced the choice to utilise qualitative methods, specifically case studies, to answer the research questions. Participants were selected through purposeful sampling to ensure validity, and data was collected through individual interviews. Using Maxwell's (2013) *An Interactive Model of Research Design*, the research design, methods, and analysis, were carefully considered to address researcher bias and increase validity.

As per Stake's (2005) *Multiple Case Study Analysis* approach, the data is first analysed per case, beginning with students with blindness and low vision in Chapter 5, then teaching staff, advisory teachers, therapists, and policy-makers in Chapter 6. Parents will follow this, then people with lived experience, the employment consultant and employers in Chapter 7. The cases will be merged, and cross-case assertions will be presented in the discussion in Chapter 8.

Chapter 5. Findings: Student Perspectives

5.1. Introduction

Chapter 4 outlined the methodology adopted by this study. Chapters 5 to 8 report the data findings regarding the research questions and goals, as outlined in the conceptual framework, in Chapter 4. This chapter reports on interviews with six secondary students with blindness and low vision attending mainstream schools. During the interviews, students discussed areas of the school system which they attributed to impact success for students with blindness and low vision in mainstream secondary schools. A total of 258 references from the empirical data of the 6 interviews were coded into NVivo. The references were categorised into three themes, induced from student responses: a) access to curriculum materials (n = 116), b) knowledge and use of assistive technology (n = 84), and c) preparedness for employment (n = 58).

5.2. Access to Curriculum Materials

The ability of students to access curriculum materials was identified as an enabler to learning for students with blindness and low vision in mainstream secondary schools. Access to curriculum materials inferred that students could engage with the academic content of the curriculum, either in the format in which it was provided or through modifications to the presentation of the curriculum, teaching strategies and/or the learning environment to enable access for individual students (South Pacific Educators in Vision Impairment, 2016). All students (n = 6) referred to modifications that they made independently and modifications that required the support from teaching and support staff to enable access. Alternate formats to enable access included digital format of materials, tactile formats (such as braille), audio access (through screen readers and audio description), as well as visual access (through enlarged and/or reformatted diagrams, graphs, and tables).

All students (n = 6) reported they were able to access some materials independently, through the use of assistive technology to alter the content in digital, visual, tactile, and/or auditory means, some examples of which included:

- provision of materials in digital form so students could access in their preferred format (all participants)
- photos of documents or the board were taken using the student's phone or tablet, and the image was enlarged with the inbuilt magnification tool (Chris, Kye)
- braille access was gained through the interaction of an electronic braille device which was able to input digital files and output braille to a refreshable braille display (Kye, Jo, Sam)
- screen reading software was employed, which read out digital curriculum content (all participants)

Students explained that the visual nature of the curriculum meant there were times when the materials required for their learning were not able to be accessed independently, for example, images, videos, and graphs (Kye) or printed materials (Chris). When students were unable to make modifications themselves, they reported that support was provided from various sources, such as their classroom teachers, support teachers within their schools, external advisory teachers or therapists, and their parents to enable access.

5.2.1. Support From Classroom Teachers

Students shared that their teachers supported access to learning by providing digital materials, either by email or uploaded on the school learning management system (n = 6). Chris shared, "some teachers, like my history teacher and my math teacher, they really did their best to support me, they … send me stuff that's electronic but before class." Students reported (n = 3) that when classroom teachers provided relevant curriculum materials in digital format prior to their class, it enabled them access to materials electronically through screen reader software, magnification tools, or electronic braille devices. Provision of electronic materials prior to class or on the online learning management system enabled students to access materials at the same time as their peers.

Kye reported visual, tactile and auditory modifications by teachers to support learning. When visual content was on the board, Kye explained how a teacher supported their learning:

> The teacher in maths, instead of writing on the board, he does it in OneNote. Or using the equation editor so I’m not reading the board. He always reads it out too. Then for the other classes and using the board, they sometimes use special pens, really dark black then I use my camera, with the black pen to Zoom in.

When the curriculum materials contained diagrams, Kye also reported that a teacher aide would create modifications through PIAFS [Picture in a Flash], tactile images created on specialised paper that had a heat-induced reaction to marks or lines, causing them to swell. Kye said that the teachers uploaded subject material onto the school’s online learning management system or by email, so Kye could use VoiceOver to read out the content at the same time as the other students in the classroom. For Kye, the teachers used a range of different strategies within the classroom which enabled learning.

Some of the students (n = 3) posited that they had the opportunity to share with teachers what modifications should be made to support their learning. Jo reported that they sat down with classroom teachers and the support teacher at the beginning of the year to express their preferred formats to access curriculum materials. Chris used emails to outline their personalised learning needs, which Chris stated supported their learning. Similarly, Jaime said they had very good communication with the support team at school and was confident to tell teachers how to make modifications. Jaime shared the ability to communicate needs with teachers was important in the long term “because it brings in interpersonal skills—you’re always having to work with people, so theoretically, you should be really good in the workplace because you’ve got really good communication skills.” Jaime had identified that interpersonal skills through working with others were future employability skills.

Jaime, Charlie, and Chris indicated that teachers would ask them about their individual preferences to access curriculum materials. Jaime shared, “they’ll ask if I need anything extra reformatted. They will check with me if I can read the documents and what they need to do.” Similarly, Charlie said that their teachers often approached them to see what they should do next or what they need to assist their learning. While some teachers asked students what modifications would be useful, from the students’ perspective, not all classroom teachers provided modifications in the classroom. Charlie reported that when teachers made modifications, “they each approach it differently.” Chris explained further, “a couple of them were problematic… but others really did their best to support me.” However, rather than rely on teachers to make modifications, Charlie preferred to make access work independently where possible in secondary school:

> In primary school, I just felt as though adults knew better... I had a teacher who wanted me to get a scribe or wanted me to write with a pen. She thought she knew best when we did the stuff she wanted. It wasn’t the best. So, I think listening to the student is the most important part …I know myself more as I get older and I feel like I know [what modifications are needed] the best. I’m in senior school. I’m trying to be a lot more independent since everything’s online.

Charlie recognised their own role in accessibility. Charlie indicated that as they progressed through school, they could access materials independently and understood what modifications were best suited to access curriculum content.

While many of the students in this study expressed confidence in explaining their needs to the teachers, Chris said they were uncomfortable receiving modifications in the classroom. Chris, who had lost central vision at the age of 9 and diagnosed at 10, shared that even though many of their teachers supported access to the curriculum through providing digital content and extra time. Chris said they were self-conscious about appearing different to their peers at school. Chris shared the impact of losing vision on their education, stating they:

> Go back and forth with acceptance and then depression, anger and denial. I'm never, never, fully okay with it. So I think depending on how mentally strong I feel, I'm much more open to things. And if I'm, like, really upset, I just don't want anything to do with any of it.

Chris pre-arranged to sit at the back of the classroom through email with the teacher. Chris explained, "I'm self-conscious of how much I have to zoom in. And I don't really want people seeing that because people say stuff and I don't need that in my day." Sitting at the back of the class enabled Chris to use the magnifier on their laptop to enlarge text without other students noticing. Chris related that the teacher supported their needs through positioning in the classroom.

5.2.2. Additional Support to Access Learning

Support teachers within the school were identified by the students (n = 6) as providing additional support to access learning. Sam reported working in a small group with a support teacher who was timetabled to work with them three times a week in their spare line. Sam and Jo reported that the support teacher received materials from classroom teachers and converted them into accessible formats, such as braille. Other students (n = 2) reported there was a department in the school, with support teachers who assisted teachers to make the curriculum accessible. Jaime clarified, "if the teacher actually made the digital copy that I can access, then they'll send it to me. But if it's inaccessible, the team at my school has to reformat it for me to access." Students identified that supports for them were provided within the school to enable access to the curriculum.

All students (n = 6) reported that they received additional time for classroom activities and assessment. Some students (n = 2) reported they received extensions, meaning the due date of assignments was extended to have more time to work on their submission. Other students (n = 2) reported receiving extra time in the format of a spare subject. The students studied five subjects instead of six, which enabled three lessons a week to study and complete their homework. Sam and Chris explained that although they received extra time on the exams, it took a lot longer than their peers to access the content through assistive technology. Chris stated, "I think one thing that's particularly tricky is that other students can skim back and read words, whereas I'd have to reread the whole paragraph again. So you definitely need any time they're going to give you." Students expressed that extra time was a reasonable modification, as it took longer to access content with assistive technology than it took their peers to read the content.

Alongside support within the school, students (n = 3) reported that external support, such as advisory teachers and therapists, was provided for the students at school. Charlie reported that the advisory teacher "comes and helps me every second week. She asks me how stuff is going, she reviews all my subjects, what we're doing in the subjects and offers any help." Students reported that they had access to external therapists and received assistive technology lessons (n = 3), along with orientation and mobility training (n = 6) which taught them skills to navigate the environment. Students reported that external supports provided services to support their learning.

Making modifications to ensure accessibility within the physical environment were also identified by students (n = 2). One example was that Charlie's school had modified the physical environment as they painted hazards yellow to ensure they were easily visible for people with low vision. Similarly, Kye said the school made modifications to the location of their classes to ensure they could move quickly through the school campus. Students shared modifications to the physical space provided access within the classroom and school environment to enable access to learning.

While students reported modifications within the school were available to support learning, Charlie said there was not the same access for extra-curricular interschool events and external testing. Charlie explained:

> My school's very accepting. I feel very comfortable … they give me the choice of what I need to do and what helps me learn best, which I think is the most useful thing. But we had this geography competition, which is out of school and we didn't have a digital version of that because they didn't get it for us. And then I went to academic services, but no one was there, everything was empty. I've gone to the library to get a photocopy to make it digital. And then I end up getting an award for it. But then this year the same thing happened. But I just said stuff it. It's not important to me. It's not school related. So I think I'll do other work. It's just extra work, [that is not accessible] like other competitions and NAPLAN.

Charlie identified places where he could receive support within the school. However, he recognised that it was not always available for after school events, which created a barrier to accessing extra-curricular activities. Parents were identified as a support for learning, by Chris, who reported receiving support to access written materials. Chris shared that they had a large amount of homework for their psychology subject, and their mother played a large role in their support: "I'd ask Mum to read this for me. Tell me what this is, because I can't see it properly. Sometimes mum would read me big, long pages of stuff." Support to access academic content for Chris was provided both at school and home to enable learning.

Students reported that modifications to curriculum content and the school environment were enablers to accessing the secondary curriculum. While many students made their own modifications, support from classroom teachers, support teachers, external advisory teachers, therapists, and parents were also required to access the curriculum.

5.3. Knowledge and Use of Assistive Technology

When asked "What assistive technology tools do you use to access learning?" students shared empirical data around technology and listed 16 different types of technology they used to access the curriculum, as shown in Figure 5.1. All students reported using a laptop with five students also using iPads and an iPhone. Two students had an additional screen to magnify the image from a laptop/computer.

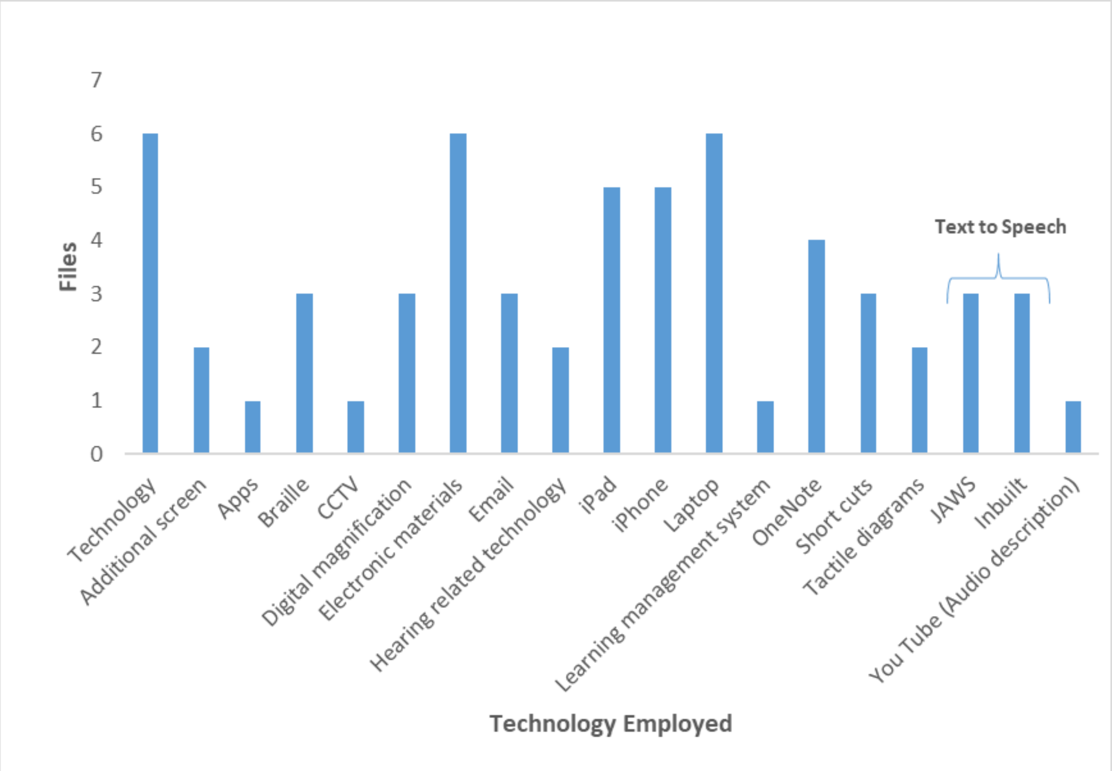

Figure 5.1 Types of Technology Used by Students

5.3.1. *Use of Assistive Technology*

Students (n = 4) used OneNote as a platform for receiving and storing information from the school, along with emails. Students also mentioned the use of shortcuts or keyboard commands to action items on the computer. In terms of braille, three of the students were braille readers. Kye accessed electronic braille (eBraille) through an eBraille device that connected to their iPhone, iPad, and laptop. Sam used a combination of eBraille and printed braille, while Jo used eBraille, printed braille, and hearing-related technology to access learning. All students used text-to-speech screen readers to access learning. Screen readers inbuilt to the device (accessibility tools provided in mainstream software, such as Voice Narrator from Microsoft and Voiceover from Apple) were used by half the students. The other three students used specialised screen readers, namely Job Access With Speech (JAWS), to access audio information from the screen. JAWS was reported by two of these students (Sam and Jo) to be incompatible with OneNote. The students said to work around, they received emails with the required work from their teachers. The students each used a several different types of technology to access learning.

5.3.2. *Knowledge of Assistive Technology*

When the students were asked, “Do you think you know enough about technology to access learning?” most students (n = 5) stated they were good at technology because they had a lot of experience using it. Charlie claimed, “I’m pretty tech-savvy compared to all my friends.” Kye and Jaime indicated their assistive technology skills were good because they had used technology all of their life. Jaime, reported they had technology lessons from the age of 6 and therefore had a lot of experience with assistive technology prior to secondary school. As with Jaime, Jo and Kye stated their knowledge in technology came from explicit lessons in assistive technology. Kye voiced, “I’m a lot better at technology than some of my mates because I have been shown how to use it.”

Conversely, Chris stated they used their computer as usual, as they were familiar with using computers before losing their vision. Chris said they had advanced skills that assisted curriculum access, as they used shortcuts to access commands and split screens for easier access. Chris preferred to explore technology independently: “I like to discover stuff myself. So when I got my laptop, in Grade 4 in primary school. I taught myself how to use it just by playing around and seeing what works and what I like.” Charlie shared why knowing how to use technology was important to them:

> We need to use a computer correctly to the level of any other employee and access any computer, not just one with all your software. When people aren’t good at technology it just stops them from learning. They spend time on their technology rather than actually doing their work. So they come into class. They spend ten minutes getting onto their technology and they could have done ten minutes of work, which means ten minutes more work at home.

Charlie expressed that knowledge of technology was an enabler to accessing the curriculum, but not all students were as confident in their skills. Sam stated, “I know a bit about technology. But I feel like there’s always something to learn and it’s always changing, isn’t it?” Students reported different levels of knowledge about the use of assistive technology to access learning. While some students said they were confident to use assistive technology, others were less confident in their abilities.

5.3.3. Barriers to Use of Technology

All students (n = 6) reported issues with their assistive technology, when it did not suit their needs, was not working, or made them look different in the classroom, all reported as barriers to learning. Jaime had a braille machine and had received assistive technology lessons. However, they had not used braille in secondary school and preferred to use screen readers instead. Both Jo and Chris told of equipment purchased for them, specifically an eBraille machine and a CCTV, which were not working and therefore unable to be used to access the curriculum. Chris also had an eBraille machine but was not interested in learning braille as they did not want to look different in the classroom. Chris shared they preferred not to use specialised equipment because "some of the technologies that are offered are just a little bit excessive, because a lot of the stuff they do, you can do with a phone already." Students shared that although technology could be an enabler, it could also inhibit access to the curriculum if it did not work or was unable to be used.

5.4. Preparedness for Employment

All participants in this study reported that they had considered and discussed possible careers with their families or teachers. Of the students, five wanted to do further study, four wanted to go to university. Charlie did not yet know what they would like to study. Jaime aspired to study music, Kye wanted to enrol in a program for technology, and Sam was considering law. Jo stated that they would like to complete a course at Technical and Further Education. Chris indicated that they wanted to take a break from study and had aspirations to volunteer or work part-time upon leaving school.

5.4.1. Skills Required in the Workforce

When participants were asked what skills they thought were required for employment, the students were able to provide a considered list of skills that they explained would be useful in the workplace. These included skills to access information through technology (Jo), technical skills to use a computer (Charlie), how to use screen readers proficiently (Jaime), and competency in Microsoft Word, PowerPoint, and Excel (Sam). When probed if any interpersonal skills that were important for future work, many of the students (n = 4) identified the importance of communication skills to interact within a team and with employers. Being able to work in a team was noted by Kye and Charlie. Kye also noted that being presentable, efficient, happy, and willing to serve were characteristics people should have to serve customers. Orientation and mobility skills to get to and from work were considered important by Sam, who was completely blind. Sam discussed how it was important to have orientation and mobility training when starting a new job, to be confident in the workplace. Students were aware of some work characteristics that they shared were important for future employment, such as general and assistive technology skills, personal and interpersonal skills to work with others, and the ability to navigate through the workspace.

5.4.2. Preparation for Employment

Students were asked what additional skills they thought needed to be taught at school, before transitioning to further education or employment. Charlie and Kye reported that they participated in programs at school which they thought were necessary for employment. Kye said their school offered a subject for all year levels called formation. In the subject, they learned about life skills, such as working in teams and how to deal with bullying. Similarly, Charlie recalled a program in the middle school, where they did team activities and learned communication skills. However, they reported that this program was not offered in the senior school. Charlie also had access to "job counsellors later in Year 11, but I think if we get them earlier that would help." All students mentioned communication and technology skills, as being useful to prepare for employment. Jo thought that it was important to be able to "navigate the computer for sources like Google, YouTube, FaceBook and Instagram and being able to find things, not only for school work, but for social." Jaime added the need for support to build assistive technology skills while still in schools. She explained "it takes a long time to learn new skills. But if you have got those skills already, and you're really competent in them, then that is useful." Kye wanted to create a resume and cover letter to be prepared to apply for a part-time job. The six students within this study had an understanding of skills that were required to enter employment, specifically skills to access the work and skills to communicate with others.

5.5. Summary

This chapter discussed the barriers and enablers from the perspective of the students with blindness and low vision and what they considered enabled and inhibited participation and success in mainstream secondary school. Students shared that when they were unable to access curriculum materials independently, education professionals and their parents supported them to access information. Support included the provision of alternate formats such as digital files or braille, reading out what was on the board, or being assisted by inclusion units within the school to assist with making materials accessible. Students noted that while most classroom materials could be accessed, extra-curricula activities, such as external competitions and examinations, were sometimes inaccessible.

Students with blindness and low vision used many different types of accessibility devices. Some students used disability-specific software and hardware such as braille devices and magnification tools and used inbuilt accessibility features in mainstream tools to access information. Some of the students identified that using technology independently was an enabler for future employment, while equipment that was not working was noted as an inhibitor to learning.

All of the students interviewed had thought about or discussed possible careers with their families. Students recognised technology skills, such as the use of Word and PowerPoint, as required for employment, along with individual characteristics, such as the ability to communicate and work in a team. Students reported that there were limited programs available in schools that attended to employability skills.

This chapter outlined the perspectives of students with blindness and low vision as to barriers and enablers to curriculum access in mainstream schools. The next chapter outlines the findings from interviews with educators: teaching staff, advisory teachers/therapists and policy-makers.

Chapter 6. Findings: Education Stakeholder Perspectives

6.1. Introduction

The previous chapter outlined data from interviews with students with blindness and low vision. Chapter 6 shares the perspectives of stakeholders providing educational services to students with blindness and low vision. The education stakeholders included teachers, support staff such as advisory teachers, therapists, and policy-makers. This chapter explores the research question: "What do a range of stakeholders perceive enables and/or inhibits access for secondary students with blindness and low vision, in relation to learning and future employability?" The three groups of stakeholders: teaching staff, advisory teachers/therapists and policy-makers were asked semi-structured questions to identify their perceptions of barriers and/or enablers to access the curriculum. Findings related to the three stakeholder groups were themed using inductive coding in NVivo. The findings from the stakeholders' perspectives will first be explored through the lens of the teaching staff, followed by the advisory teachers/therapists, and finally, the policy-makers.

6.2. Findings: Teaching Staff Perspectives

This section reports on the data from interviews with teaching staff (n = 6) which provided insights on barriers and/or enablers within mainstream schools for students with blindness and low vision. The participants (Figure 6.1) included two classroom teachers: John, who specialised in humanities subjects, and Luke, who specialised in maths and science. Three support teachers Lisa, Kate, and Nic, were interviewed. Their role was to support classroom teachers within mainstream schools to enable the inclusion of all students with disabilities. A teacher's aide who supported a student with complete blindness, Toni, was also included as a participant for his perspective within the classroom context. A total of 103 references were coded into NVivo categorised into three themes that arose from the findings: a) access to learning (n = 37), b) building knowledge within the school context (n = 30), c) understanding the student's context (n = 21), and d) skills for future employability (n = 15), which are presented in the following sections.

Classroom teachers	John (metropolitan) Luke (regional)
Support teachers	Lisa (metropolitan) Kate (regional) Nic (rural/remote)
Teacher's aide	Toni (metropolitan)

Figure 6.1 Anonymised Participants: Teaching Staff

6.2.1. Access to Learning

Teaching staff identified that access to learning was not always accessible for students with blindness and low vision due to the visual nature of the curriculum, the way it is delivered, and the nature of the physical school environment. John, a classroom teacher, explained that barriers existed for students to access curriculum "because a lot of the work content, and the way it is delivered, is not always suitable to children with vision impairment." Teaching staff identified that students with blindness and low vision required modifications to ensure access to learning at the same level as their peers. Modifications were required to the curriculum content (such as increased font size or use of technology to access written information), teaching pedagogy (such as using auditory descriptions of content), and to the school environment (positioning in classrooms and safety moving throughout the school).

6.2.1.1. Modifications to Access Curriculum Materials

Curriculum content which was presented visually, such as printed material, writing on the board, and diagrams in textbooks, were identified by teachers as difficult to access for students with blindness and low vision. Luke, a senior secondary maths and physics teacher, reported that the size of print in textbooks was a barrier to access for students. He added that he was able to source “online textbooks and large print textbooks” for his students. Luke reported on the impact of increased font size and the use of simple modifications of contrast and colour, which he observed to be also useful for other students in his class to access the curriculum materials. He discussed trialling different coloured paper in the classroom “the couple of students I found where in maths, they’ve been struggling …the problem is the visual input where they [the students] talked about the page is really glary or on graphs.” Luke said he also used dark coloured pens when writing on the whiteboard to enable students with low vision to read the writing. Luke also identified diagrams and equations in mathematics as difficult to access for students with blindness and low vision. For his students who used screen readers, he contended the text to audio did not read equations as they were often inserted as images, rather than text. Luke found that trialling simple modifications within the classroom worked well to increase access to printed materials for students with blindness and low vision. He also identified the positive impact of these modifications on the learning of other students in the class.

Providing modifications in tactile formats, such as braille, to enable students with blindness and low vision access to curriculum content was also identified by support teachers. Kate shared that “modifications of assessment and the everyday content of the curriculum being transcribed into braille” were commonly used for the students she supported in the school. She sourced braille materials aligned to the curriculum from the alternate format library, a centralised library run by Statewide Vision Services, which held a repository of brailled curriculum resources. If materials were not available from the alternate format library, Kate created new tactile resources herself.

In terms of teaching pedagogy, Luke explained how he endeavoured to listen to what worked for the students. He related an example of this where he recorded videos for the students: “it was driven by the students actually asking for it and they were using it. Amongst other things, for revision time, they just went back and heard the same explanations again, exactly the same way to remind them." Luke perceived one of the benefits of video revision was that it had his own personal voice. He stated students "learn to hear the nuances much better over time, so you get more out of out of a familiar voice than you will out of an unfamiliar voice." Luke had used a variety of modifications to the way curriculum was presented and to his teaching pedagogy to provide all students with access to learning.

When teaching staff were asked, "What do you think works well in education for students with blindness and low vision?" all three support teachers identified the support of classroom teachers. Kate voiced that "a lot of the class teachers are really interested and very proactive in trying to accommodate and differentiate to include the students as part of the class." She detailed effective inclusive pedagogy "starts with basically having a teacher who is flexible and wants for that student to be able to participate alongside their peers in the mainstream classroom." Kate explained sometimes teachers want to do everything for students with blindness or low vision "but that won't help them when they go into employment. There's a very fine line between knowing when to step back and knowing when to step in." Teachers were aware of the need to assist students and expressed that it was important for teachers to allow independence, which will be required in future employment.

Teachers identified that teacher aides assisted students through support within the classroom, and preparation of accessible curriculum materials. Toni, a teacher aide, outlined that he provided assistance for a student with complete blindness in particularly visual subjects, maths, hospitality, and woodwork. However, in John's view, teacher aides can sometimes be an inhibitor in the classroom, as they can cause some students to feel like they stand out. John said he endeavoured to "normalise things as much as possible so that all the other children could see that children with vision impairments were, well obviously they were different, but not stand out different." John was aware of the needs of students with blindness or low vision and tried to support their social inclusion, by considering the role of the teacher aide within the classroom context.

6.2.1.2. Barriers to Access to Learning

When asked "What do you think is a barrier for learning for students with blindness and low vision in the mainstream secondary classroom?" all teaching staff (n = 6) recognised time as an inhibitor for teachers to create modifications for students with blindness and low vision to access curriculum materials. According to all teaching staff, increased time was needed to modify resources, source content, provide instruction in disability-specific skills, and also for students to access the curriculum. Kate observed that time constraints impacted teachers in terms of "modifying content and teaching pedagogy for the students. [Teachers] find that hard sometimes to incorporate in their day, especially if they get into the upper years because the curriculum content is so heavy".

John recognised that it took additional time for classroom teachers to modify content for access to the curriculum for students with blindness or low vision and "they don't say here is a student in your class with a vision impairment and here's an additional five hours of time a week." Luke also said that time presented a barrier: "no one has time. I am now working 4 days a week and I struggle still with time." As a support teacher, Kate expressed she was frequently under time demands with "teachers coming and saying I need this tomorrow can you braille it up? Or they change their assessment and then you have to go back."

In a similar role, Lisa was also required to modify materials into accessible tactile formats under tight timelines. She said this made her "feel like you're constantly scrabbling to just stay above water." Lisa expressed, "I don't have enough time to be able to satisfy all of the skills that they need." For Lisa, this meant "there's a lot of things, especially the technology side of things that I do in my own time because I don't have time at school." Furthermore, Lisa also observed that students lacked time to access the content. She related that for students with blindness and low vision, "they have so many compensatory skills that they have to try and learn, within the rigor of an academic load, to be able to even try to maintain any sort of pace with their peers." Lisa expressed that she constantly advocated for the students with blindness and low vision to access more time to complete their work. Teachers identified time as a barrier in their workload to prepare for students with blindness and low vision and for students to learn disability-specific skills required to access curriculum materials.

Assessment was identified by teaching staff (n = 2) as a possible inhibitor for curriculum access if it were not provided in an accessible format. Luke shared that introducing a standardised Australian Tertiary Administration Rank (ATAR) in 2020 to measure the performance of senior students across the country resulted in many senior exams assessed externally to the school. He articulated his experience of applying for consideration in external assessments "presumably you have to somehow convince the [Curriculum body] that the student actually has a genuine need." Luke voiced that he had "applications being made with medical advice from specialists, and they still knock it back and it's like, you have no authority to decline what a medical professional has said." Luke offered an analogy of an image "about equality, versus equity, equality is everyone's trying to see over the fence, but some are too short. You know, give them things to stand on the right heights" (see *Equality vs Equity*, https://www.diffen.com/difference/Equality-vs-Equity, for an explanation). "Everyone's trying to see over the fence, but some are too short. You know, give them things to stand on the right heights". He articulated that he was "frustrated as they're not trying to cheat" and expressed that students should have access to the range of supports to assist them in demonstrating their knowledge to the external assessors. Luke reflected, "my goal is to see what they what [students] are capable of." Nic had similar experiences: "when I was working with these students, I felt frustrated by the system." He expressed, "I'm always having to fight and argue … because they can't or won't support the child." Teachers shared that gaining equitable access to external examinations was a barrier for students with blindness and low vision.

A classroom teacher identified barriers to accessibility for specific subjects. Luke was concerned that students might have selected subjects based on accessibility rather than their personal preferences. He detailed an example from his classroom experience:

> I'm teaching specialist maths, how do I explain the syntax of writing an integral or something to someone who can't see? Serious maths is complicated equations, and we spend so much effort in the teaching in how to set things out, how to line things up. There's diagrams, there's complicated syntax, and none of that can be read out by a computer, none of that is easy to translate into braille.

Luke was also concerned that students would not gain abstract concepts within mathematics without visual information. He said as a result "unfortunately, many of our students don't pick those subjects because they're hard, which is disappointing because then it may limit their career choices." Classroom teachers identified that some subjects were difficult to access for students with blindness and low vision. It was identified that this resulted in some students not choosing subjects that were difficult to access.

The physical layout of the learning environment was identified as a potential barrier to learning for students with blindness and low vision. John explained, "one of the things I always did, was making sure the classroom layout didn't change." This small modification meant that "students with vision impairment would not have to worry about a change: the cables have been moved to there, or the chair has been moved there" (John). He was also aware of modifications needing to be considered to the school environment, detailing the "physical layout of things in the grounds may need adjusting, like handrails and high vis around poles." John identified that barriers to learning could also be from the students' ability to navigate around the school's physical environment and within the classroom.

6.2.1.3. Technology as Both an Enabler and Barrier to Learning

Using assistive technology was a disability-specific skill that teaching staff (n = 6) identified as an enabler to accessing curriculum materials. Teaching staff explained that when students had access to technology tools and the skills to use them independently, assistive technology provided students with blindness or low vision the ability to make modifications to the format of the content independently. Conversely, it was a barrier when students were unable to access suitable technology to make independent modifications to their learning.

Access to suitable assistive technology for the individual was highlighted by teaching staff (n=3) as important for accessing the curriculum by students with blindness or low vision. According to classroom teacher John, “making sure they’ve got the right equipment, laptops and all those sorts of things” enabled students to access the curriculum content. Trials of equipment to ensure students had tools that suited their personal needs were identified as enablers to success by support teachers, Kate and Lisa. Kate contended it was important to trial “all the assistive technology and find out what’s going to suit each individual student.” Lisa added she preferred students “to be able to engage with different pieces of technology for however long, like a term or something to work out if it’s viable” prior to purchasing devices. In her opinion trials were important because “it may sound really good, but it’s ineffective for whatever the task before it might be for.” Teaching staff identified that when suitable assistive technology was not available to students, this presented a barrier to independent access to learning.

Inequity in access to assistive technology was identified by support teachers (n = 2), who noted the diversity in access by geographical location and by an understanding of the need for assistive technology within the school setting. Nic suggested that in rural areas, having information communication technology systems within the school that supported assistive technology was limited and presented a barrier to access. He also reported that students with assistive technology looked different from their peers, making them stand out. However, Nic also offered that technology in rural areas has improved in recent years and that most students in rural schools now use laptops. Kate, who enacted the support teacher role in a regional area, reported potential barriers to accessing technology if the administration were unaware of their responsibilities for access for students with disabilities. She shared an example:

> When you do go to admin and ask for certain things like it might be like a laptop for them or a computer or whatever, they think we'll get NDIS to provide that for them. I have to say no—it's the school's responsibility to provide access to the curriculum. If the student can't access the curriculum then what is the school doing? What adjustments and modifications in school as a whole are [they] going to make so the student can? And if that means the students need a laptop or a screen reader or whatever, then there is a budget there for that sort of thing.

Support teachers identified inequities in access to assistive technologies by geographic location and from administrators' understanding within schools.

Teaching staff noted barriers to access to curriculum materials due to the visual nature of the curriculum and shared modifications they had implemented to ensure content and the learning environment were accessible. Support for students from classroom teachers, support teachers, and external supports enabled students to access learning. Time was raised as a barrier to learning, time for the teachers to prepare accessible content, and time for students to access the content. Teaching staff identified that assistive technology was important to enable students to access learning within the school, however it could also be a barrier to learning when students were unable to access suitable technology.

6.2.2. Building Knowledge Within School Contexts

All teaching staff (n = 6) discussed the role of support teachers, or support units, within their schools as assisting teachers with making modifications to formats or teaching pedagogy. External support of advisory teachers/therapists who visited the school to provide expert advice, specific to blindness and low vision was also noted as an enabler to access to learning for students in mainstream schools.

6.2.2.1. Support Within Schools

The role of support teachers within the schools was to support classroom teachers in making adjustments for students with disabilities and learning needs. Luke shared that his school included a student development centre, where there were support teachers who directly interacted with the students and advised teachers within the school. John explained the support teachers in his school assisted him in changing the lessons for students with blindness and low vision and organised teacher aide time when required. As a support teacher, Kate shared that her role involved implementing "modifications to assessment and the everyday content of the curriculum" but also as a resource for the classroom teacher:

> You know the class teachers are responsible for the student but I also feel like I play a massive role as I am there not only to support the student but also to support the teacher to be able to support the student.

While support teachers were considered an enabler to learning, the interviews revealed that not all support teachers had specific knowledge in blindness and low vision, which according to Luke was a barrier to supporting the student within the school. Luke shared that while the support teachers in his school were trained in special education, "there's no particular expertise in visual issues." Nic, a support teacher himself, shared that he often "felt totally inadequate" when he assisted students with blindness or low vision. He said he received support to make modifications from advisory teachers and therapists.

6.2.2.2. Access to External Advisory Teachers/Therapists

External support and advice from advisory teachers/therapists were enablers to student learning. According to classroom teacher, John, advisory teachers "worked very, very hard to do the best they could for the students." John shared that in order to cater to the personalised needs of students with blindness or low vision, "you need adequate resources—so that is the visiting teacher service as well." John explained that he had been provided with customised advice from the advisory teacher for an individual student with low vision, which he said was very practical for the classroom. John shared that external therapists came to the school and taught assistive technology skills and touch typing. John voiced he wished the visits from advisory teachers/therapists could be more frequent: "I mean, they'd be great if they could visit more often, but unfortunately the resources are spread pretty thin."

While John deemed external disability-specific resources as important to meet the needs of the students, he explained that the services of advisory teachers/therapists were not always encouraged by the school administration. John said pressure to make modifications for the students independently as he said administration thought "preparation is up to the teacher" whereas John contended "that goes a little bit deeper than just the teacher because that teacher has to be supported by the school." Teaching staff identified support teachers from within the school and recognised that external advisory teachers were available to provide specialised advice regarding blindness and low vision to support classroom teachers. It was identified that the understanding of the needs of students with blindness and low vision of administrators within schools influenced the support available within the school for classroom teachers.

6.2.2.3. Professional Development

Professional development required to build the capacity of the teaching staff was reported by this group of stakeholders (n = 5) as an enabler to students' learning. However, in Luke's experience, gaining specific information to support students with blindness or low vision, was difficult to source. He discussed he had been "to a few sessions at conferences, where people talked about this, but it's not a common thing." Kate asserted professional development should be in schools: "if you've got a student in your school with a vision impairment, no matter how severe or minor. There needs to be professional development." Nic further posited access to professional development should extend to relief teachers, as "there's a real, real trouble when you have, itinerate or release staff. Often they're not aware of the students' needs."

John explained that professional development can assist teachers to gain an understanding of the needs of students with blindness and low vision. He shared:

> There should be some level of training for all teachers within the schools as well because I know that can lead to frustration for those students, because sometimes the teachers don't understand their specific needs and sometimes those kids get excluded from activities which other students in the class are receiving. And that's really not adequate.

Kate shared that professional development within the school was important to raise awareness of the needs of students with blindness and low vision within the school. She said that she worked "in a massive school with a massive staff and people's attitude is just, well, I don't have anything to do with them. They're not in my class." Teachers recognised that professional development was not just important for classroom teachers, but also for relief or casual teachers, along with all school staff to understand and support the needs of students in their learning.

Professional development to build capacity in technology, which was seen as important for students and teachers to gain the requisite skills to use new technology effectively. John reported that in his classroom, "some students are very good at using [technology]. Some kids are better at it than the teachers and most of them better than me." Lisa identified that even if students were efficient in using technology, ongoing training in assistive technology was important to ensure students felt well equipped to use new technology. Training for teachers about assistive technology was identified as something that would be an enabler to supporting students with blindness and low vision (n = 3), for example by Toni, who shared, "I would love to have the opportunity to have ongoing technology training.” John expounded on the benefits for teachers receiving training in assistive technology:

> Administrators in schools should be aware, that if they’ve got children have visual impairments coming through. They should make sure that those staff members who are going to be teaching those children get PD in the use of that equipment so that it doesn’t become an issue in the classroom.

In her experience as a support teacher, Lisa shared that knowledge about the technology used was “all self-taught, because there’s not the scope, nor is there the opportunity here, for suppliers to come out and demonstrate it.” Teaching staff recognised the importance of professional development for students and teachers to learn about assistive technology and how it can function to access the curriculum for students with blindness and low vision.

Professional development for school technology specialists was also identified by teaching staff (n = 2) as an enabler to support students with blindness and low vision. Nic reported that in his school, “the system wouldn’t allow you to connect devices because there were too many firewalls in the school in the state system.” John recounted occurrences with “days on end when the child needs to have access to something and the school technicians don’t understand the specific equipment that kids with vision impairment bring in.” He added that as students were using the equipment to access the curriculum “it’s very important that that’s functioning. And that we can get those things fixed as quickly as possible.”

Quality and timing of professional development were further recognised as important to develop the knowledge of staff within the school. Nic experienced there was little time for the professional development of staff within his remote school. Even though he thought the advisory teachers were “passionate”; “they fly people in, get a bit of advice and fly out.” Kate concurred, it “can’t be just a 1-hour video, and they go good luck with it. It has to be on-going and it has to be checked on and reflected on.” Kate stressed that professional development should be provided “at least a couple of times a year, every year until the student leaves. Because things are changing for that student over time.” Kate added that she had only “really been to a handful of things. Probably not as often as what I should have been.” She advised this was because she can not be out of the school or she would not be available to support the students and their classroom teachers. Supporting the school community to build knowledge and understanding of students with blindness or low vision was reported as an enabler to curriculum access. Support teachers within schools, external advisory teachers/therapists, and professional development for the whole school community were also identified as supporting student success in mainstream schools.

6.2.3. Understanding the Student’s Context

Teaching staff identified that students had unique characteristics and contexts that may enable and/or inhibit access to learning within mainstream secondary schools. Toni shared that the unique and diverse needs of students with blindness and low vision meant that what works well for one student may not necessarily work well for another. Nic echoed that the learning needs of students with blindness and low vision “are variable. They sometimes don’t know what their needs are or there are barriers in front of them. Sometimes they put them there and sometimes the school puts them there.” John related that it could be difficult for a student with blindness and low vision in the classroom and said it was important to understand what they may be feeling:

> Just understanding their level of frustration when things don’t always go right. Like the technology may fail, or the level of understanding that they might be showing, or they just may not be able to understand what’s required of them simply because they do have the vision impairment that they actually can’t see what other kids have in front of them or displayed on multimedia.

John identified that when students could not see what they were required to in class, they may become frustrated when the curriculum was not accessible.

6.2.3.1. Individual Characteristics of Students

Personality attributes may influence learning outcomes for students with blindness and low vision, according to Lisa. She shared her experience with two students she had taught, who possessed differing personality attributes. She explained their contrasting characteristics, "[Student 1] is really engaging. He enjoys socialising so everybody knows who he is. Then there is [Student 2] who has the most sassy, beautiful, fun, cheeky, wild, dark, everything…but very few people know who she is." Whilst Lisa related how personality might influence how students engaged in the classroom, she also was aware that these students had different levels of vision. Student 1 was completely blind and Student 2 had low vision. Lisa shared how levels of vision may impact access within the school:

> So the perception in this school is that, [Student 2] is vision impaired, but they don't realise just how significant her vision impairment is because she has so many strategies that she employs. And sometimes that difference between when you're totally blind, well people know that you can't see anything. But if you are vision impaired, people assume that you're seeing.

John also expressed that "students with a vision impairment, sometimes they're a little bit overlooked. And that's a concern." Kate related a similar story, where students with low vision would "fly under the radar" in the classroom:

> I feel like because they've got glasses on and they're sitting at the front and they seem to be coping. They can very often fly under the radar. And they often develop their own little coping strategies, especially

> when they get to the upper years because they don't want to be seen as different to their peers and they can very easily fly under the radar.

While teachers noted that it was important to get to understand the student's individual context to as an enabler to personalise their learning, Lisa proposed that despite classroom teachers wanting to learn about students individually, time constraints and limited contact with students, may impact this pragmatically:

> In the scheme of things, we're talking about 1 student in a class of 28. And each teacher has they teach five lines. So you're looking at 150 of students that these teachers having face to face contact with per week. So it does you know, it does become more challenging for them. And it's not that they don't try, but it does become a lot more challenging.

According to Nic, the reduced time spent with students in secondary posed a barrier to supporting students' learning in secondary. He reported that "teachers don't have the same level of relationship with the students as in primary school, because they see so many students." Teaching staff in secondary schools recognised the small amount of time they were allocated to teach each student, which was a barrier in getting to know the students' individual learning needs.

6.2.3.2. Being a Senior

A further barrier to success, according to teaching staff (n = 4) was being a senior student with a disability within the school environment. Nic thought creating relationships with students was more difficult in secondary as "high school is a really tricky age, there's often pushback from the students." Luke shared that in secondary schools "many of the students are disengaged to begin with for one reason or another". While John identified that secondary could be a difficult time for all students as "peer group pressure at those ages are quite strong," he also reported that from his observations, it was even more so for students with disabilities. John explained that it appeared to be common for all senior students that they don't like to stand out in senior schools. Lisa reported examples where students with blindness and low vision wanted to blend in, such as a student who stopped using her cane to get around the school. She said this was problematic in terms of mobility for the student but explained this was common among students with blindness and low vision. Nic added to this theme relating an anecdote of a student who was legally blind who "wouldn't use a laptop for magnification or auditory because nobody else in that school or that year level used laptops ... I do think having a vision impairment in senior is hard work." It was recognised by teaching staff, that the age of students in secondary made it difficult for teachers to connect with students. Additionally students with disability were not wanting to look different than their peers in the classroom.

6.2.3.3. Parents/Carers

Three teaching staff (n = 3) identified the influence of parent/carers as being an enabler or inhibitor for student curriculum access. They discussed how parental attitudes, decisions, and advocacy from the early years could impact educational provisions in later years. Nic articulated that a supportive family was an enabler, whilst Toni shared that "sometimes parents don't want them to do any sort of life skills at programs school" which he said was an inhibitor to curriculum access. Nic recognised that parents made decisions throughout schooling which could impact students. Although not directly related to secondary, he retold a story of a student who:

> …was meant to come into Grade 1, but she has been held back in kindergarten. The reason given was that there wasn't adequate support at the school, but I think actually the parents just wanted it [sic] to stay with her cousin in kindergarten because it's easier.

Aside from making decisions that impacted education, Kate expressed that parents are important in the context of the student "because they know their kids better than anybody.” She contended that parents really need to be proactive in their child’s education from early years and advocate to the administrative staff to know what these students need. She expressed that there have been circumstances where she would have liked a “little bit more input from the family sometimes to push or advocate.” She gave an example of a family that had purchased equipment for their student, at significant cost, for their son to use at school. As no one in the school was trained, she expressed that the family should have lobbied the school to ask, “what are your staff going to do to upskill in this area?” Teaching staff identified that parents/carers could be enablers or inhibitors in the context of learning.

Teaching staff identified individual attributes they observed influenced students’ success in school, including the inherent barriers of being a teenager in senior school, understanding the student as an individual and parent/carer support.

6.2.4. Skills for Future Employability

Teaching staff were asked “What do you do to prepare students with blindness and low vision for future employability?” Classroom teachers (n = 3) responded that they focus on the content of the curriculum during their classes. Luke additionally reported that in physics, he had provided students with organisation tools to support secondary tasks: “I create checklists from the syllabus for the seniors, which I make available to them so they can print off and tick off and keep check as they go.” He contended that providing checklists in a digital format, “would equally help someone with visual impairment because that can turn into whatever format will help.” Luke reported that he was trying to build organisational skills for future employment within his subject area.

6.2.4.1. Disability-Specific Skills

Explicit teaching of disability-specific skills was recognised as important in developing employability skills for students with blindness and low vision by the support teacher and the teachers’ aide (n = 3). Disability-specific skills, also known as the expanded core curriculum were utilised to support the explicit teaching of skills to students with blindness or low vision, to compensate in accessing information that is usually received visually. It was contended by the support teachers (n = 2) that disability-specific skills, ensured students with blindness and low vision gained the skills that their sighted peers develop incidentally, to ensure access to learning and prepare students for future employment. Lisa considered an important part of teaching in a support role, was to advocate for time to teach the expanded core curriculum within the school because:

> Students with a vision impairment, whatever vision impairment that may look like, they have so many compensatory skills that they have to learn, within the rigor of an academic load, to be able to even try to maintain any sort of pace with their peers.

From Toni’s perspective as a teacher aide, it was evident that “academic is more important. But I think we’ve got students who don’t get to do basic life skills that sighted kids take every day for granted.” Nic related his thoughts regarding the academic focus of secondary:

> I think there is a focus on moving away from a disability-specific support to a curriculum focus. I might be wrong about that. But that’s the feeling that I got that the disability-specific stuff wasn’t important. But for a student who is blind or vision impaired it really is.

Nic related that disability-specific skills were important to sit alongside academic skills to help students access learning.

Support teachers, and the teacher aide, explained the importance of disability-specific skills for students with blindness and low vision to access learning and prepare for future employment. These findings indicated that teachers were preparing their students for employment through teaching subject specific content and organisational skills, necessary for the workforce. The following section outlines the perspectives of advisory teachers/therapists, who provide external support to schools to support students with blindness or low vision.

6.3. Findings: Advisory Teachers/Therapists Perspectives

The following findings are presented through the lens of advisory teachers/therapists who support families, teaching staff, and students with blindness and low vision. It is noted that advisory teachers can be called different names through different states. They enact the role of expert teachers who specialise in the education of students with blindness and low vision, employed and managed by Statewide Vision Services in each State or Territory. Four advisory teachers were interviewed including: Carole and Heather, who worked in metropolitan schools, and Cliff and Barbara who supported students in rural and remote areas within the State. The therapists interviewed included: Sarah an occupational therapist and Terry an assistive technology consultant, employed by blindness-specific organisations, based in the metropolitan area (Figure 6.2). A total of 181 references were coded into NVivo under the themes: a) attitudes towards blindness and low vision (n = 44), b) student support systems (n = 98), and c) preparing students for post-school transition (n = 39). The results are discussed in the forthcoming sections.

Advisory teachers	Carole (metropolitan) Heather (metropolitan) Cliff (rural/remote) Barbara (rural/remote)
Advisory therapists	Sarah (metropolitan) Terry (metropolitan)

Figure 6.2 Anonymised Participants: Advisory Teachers and Therapists

6.3.1. Attitudes Towards Blindness and Low Vision

Advisory teachers/therapists voiced that for many students if something was a barrier to access, then the opposite were enablers. An example of this was with attitudes towards blindness and low vision. Negative ideas of disability and misunderstanding of abilities of people with blindness and low vision were identified to cause barriers to learning, whereas, if families, teaching staff and students had attitudes held aspirations to succeed, then these were enablers to curriculum access.

Negative attitudes were purported as a barrier, by Heather. She explained that in her experience there could be "an assumption from teachers that because a child has a disability that they have an intellectual impairment. That they pick things up slower or need more reinforcement." However, for the students she supported in mainstream schools, she suggested "this is not always the case with students with vision impairment, as they often just have difficulty accessing information." Conversely, Heather reported it was an enabler "when teachers want to learn more this is often an attitudinal perspective, based on teachers own initiative to learn more." Carole discussed that, as with other students in the classroom, teaching the student first helped to understand and consequently meet the students' needs. She reflected, "you don't have to know everything about this student. Just get to know them and get to know how best to teach them." She suggested that classroom teachers "modify the learning experiences, and then see what they've learned and then go from there like you would with all the sighted kids. Just this one doesn't see or doesn't see clearly." Advisory teachers identified that when people had negative attitudes towards disability, this could be a barrier to learning, while getting to know the needs of the student, was identified as an enabler to learning.

6.3.1.1. Lack of Knowledge

Lack of knowledge about the needs of students with blindness or low vision were also reported by Carole as an inhibitor to learning. Carole explained that this may have stemmed from the likelihood that teachers "haven't had kids who’ve had a vision impairment before.” Carole recounted that in her experience most teachers were ”anxious to begin with” about what they should do in the classroom. She said feeling unsure of how to teach a student with blindness and low vision “provoked anxiety” for some teachers. Carole reflected that “a lot of people, probably, myself included, when we’re in a new situation and it’s our very first experience, feel the need for reassurance.” She reported, however, that this lack of information led teachers to generalise from other experiences, “sometimes if they go off onto the internet they can actually get misadvise, like Dr Google, or sometimes people have seen a movie with a blind person in it.” In one case, this was particularly unhelpful as Carole related the following situation:

> I have been asked, should we go around the class and let her feel everyone’s face? I said no… that’s totally inappropriate. People don’t go around touching other people’s faces. But that’s what you see in the movie and that’s where people are getting it. We have no other information. That’s what they rely on.

Advisory teachers shared that teachers had limited prior experience of people with blindness and low vision and may feel anxious about teaching them in the classroom. Limited knowledge and exposure for parents/carers were also described by Sarah:

> Families haven’t had an opportunity to meet with adults with blindness or low vision, or maybe do not really know where to set their expectations and their aspirations about what’s possible for their son or daughter, then that can sometimes influence their own messaging that they’re giving their child. Families are so important in helping their young person to make decisions and make choices about the future and therefore beliefs and aspirations of those around you, what you’ve been hearing your whole life … those beliefs make a difference.

Sarah shared the important role parents played in influencing their child's attitudes and aspirations.

6.3.1.2. Expectations of Students

Terry shared that low expectations for students with blindness and low vision were barriers to supporting students learning. He explained that barriers to independent access to learning were created when "teachers who adjust for sympathy and empathy, grabs hold of the student, cradles their learning to get them to pass, or students in their mid-teens and completely dependent on a parent." Terry reported students in families where it is "a doting environment, where things get done for the child," that the student may not have gained the independence that was required to ensure success in school. He articulated that he has seen students in secondary dependent on their parents "to the point at one stage where a parent wanted to wait outside the classroom until the lessons finished and take them home because they are concerned that they might wander up the hallways and into the wrong room."

Conversely, Terry said that an enabler to success, was if "they're in a family with other siblings that don't have a vision impairment or blindness." He conceived this gave the student with blindness or low vision "opportunities to just test the boundaries and still do the same thing, play all the games, climb the tree in the backyard, all of those things." Terry communicated that a dependency on the teacher or parent, was not sustainable. He maintained that if "things aren't done independently and are done for them [students], by the time it comes to tertiary, you have a scenario where they expect others to do things for them."

Terry reflected that at times parental attitudes of over-protection towards students with blindness and low vision were evidenced from older generations regarding what people with disabilities can and can not do. He explained:

> If you go back not so long ago, it was only back in the late 60s blind people would not be encouraged to travel on general public transport on their own…some

> of our teachers in their schools are older and so, therefore, they have a bit of a fixed mindset on what a person who is blind can or can not do as opposed to. There should be nothing that they can or can not do is just done in a different way.

Advisory teachers recognised that low expectations and over-protection by both parents and teachers could provide barriers to learning, due to students being dependent on their support. Conversely, high expectations were reported as an enabler to learning. Heather related that students themselves need to have an internal belief that they will succeed at school and have aspirational goals toward university and employment. She considered that access to the same curriculum was possible, and students should be “should be making decisions, troubleshooting and advocating for themselves, as this is important for the work environment.” Within secondary Heather thought it was important for students to be independent with their work to support the development of “skills so when they go to uni and the workplace, they can do anything with the skills they have.” Students having high expectations about their competencies and future aspirations were seen as an enabler for success for learning and future employment.

The family’s levels of awareness and knowledge in how they “supported their adolescent to get ready for life beyond school” (Sarah) was seen as an enabler to success. According to Barbara, some parents were not aware of opportunities within or external to the school that may support their students. She detailed, “I think some parents are not up to speed or don’t know what to ask for.” She provided an example of a program available through an external provider, targeted to develop career readiness, for students with blindness or low vision. She viewed it as useful for some of her students, however, voiced that parents lacked an understanding of the importance of the program. This concerned her that “we are not really getting the message of opportunity and participation across [to parents] in the same way as we should.” Sarah stated that “having a broad range of experiences outside just academics” ensured students were prepared for “transition that into a tertiary setting, community participation, and an employment setting.” She perceived these experiences could be derived from “some form of work experience or volunteering or helping out. Doing and having responsibilities at home. Having an experience of using public transport.” Sarah imparted that encouraging students to have a focus on their life beyond school, assisted with preparation for further education and employment, along with future life aspirations.

Attitudes held by families, teachers, and students were identified as barriers and/or enablers for students with blindness and low vision to access the curriculum. This included barriers of negative attitudes of disability and stereotypes, and enablers of high expectations and planning for future life goals.

6.3.2. Student Support Systems

Collective expertise and support focusing on the student, was identified by advisory teachers/therapists (n = 6) as an enabler to curriculum access for students with blindness or low vision. Carole summarised:

> Needs are most likely to be met when there is a team of teachers, and sometimes other professionals around them, who are working together with that student so that as needs change and as awareness changes and as circumstances change, everybody can be flexible together.

Heather contended that success could be supported by all stakeholders collectively “ensuring that they have the information they need to make good decisions.” Cliff shared an example of working together in “a very successful situation” of a student in secondary. He said the success was due to “a lot of dedication by everybody”:

> I only met him in Grade 11. He came from a very supportive family. He had a very good advisory teacher, who had been in it for a long time. And I think he had a teacher aide who basically went all the

> way through school with him and he ended up at university.

Sarah proposed that a barrier for learning for students with blindness or low vision was when “all systems within schools might not necessarily know what is needed for those students” and claimed good systems within the school helped to support the students. Heather identified that it helped to have one person within the school who had expert knowledge, which Cliff proposed “a good case manager is always very helpful.” All advisory teachers recognised the role of support systems within schools for students with blindness and low vision and reported that when the systems were functioning well together, students support to access learning.

6.3.2.1. Access to External Advisory Teachers/Therapists

Access to trained and experienced external advisory teachers/therapists within the support team was also viewed by this group of stakeholders to support student success. Advisory teachers/therapists reported they visited schools to upskill teachers “in understanding the impact of vision impairment” (Barbara) and share knowledge of modifications that could be useful to access learning. This included working with teachers, students, and their families to enable access to the curriculum in the classroom. Cliff explained that the role of the advisory teacher/therapist was to “make some suggestions about adjustments and you can touch base and you can see how the [students] are going.” Barbara added that the role also supported teachers to consider their pedagogy in the classroom, as she said making modifications “is also around how you actually teach.” According to Heather, by the time a student is in secondary advisory teachers/therapists should have less involvement with students. She said, “if I have done my job properly my students should be independent and not need me in secondary.”

Cliff, became an advisory teacher, after a number of years’ experience as a classroom teacher. He commented that a large benefit of the support from advisory teachers and therapists was the role of interacting between students, parents, and teachers. However, he reported differing responses to how his knowledge as an advisory teacher was received and implemented within different schools. Cliff said that he went into schools to give advice on how to support students with blindness and low vision, “people could choose to take it or leave it” either because decision-makers in schools “don’t want it, or didn’t think they needed it.” Barbara also expressed there can be a “lack of good understanding at the ground level that required schools to access educators [advisory teachers] and also external agencies [therapists] as well.” Advisory teachers shared that their role included providing expert advice in schools to support students with blindness and low vision to access learning, however, two advisory teachers reported variability in how schools utilised their advice.

6.3.2.2. Support From Peer Networks

Interacting with peers was identified by advisory teachers/therapists (n = 4) as a support network that could enable success for students with blindness or low vision. This included interactions with sighted students and peers with blindness or low vision. Terry discussed that it was important that all students were “confident to interact with other people.” To do this, he suggested that students needed to develop social skills because the “interaction and independence that comes from socialising makes it a much easier for them to integrate in the class environment.” Similarly, Sarah understood the ability to interact with others was an important enabler. She added, “even if personality-wise, they are the shy and retiring type, that’s okay. Just having an understanding of the social interactions that happen, particularly nonverbal communication and understanding the social norms of your cohort of your peers” which she said supported students’ overall development.

Barbara posited students required an understanding of “age-appropriate social interactions skills.” Terry concurred that social skills could be learned through “making connections” through involvement in sport or clubs with students in their own age group, such as “Girl Guides” or “Cubs” or in blindness specific groups, such as “braille camp.” Sarah also considered it was important that students with blindness or low vision should be “able to participate in having those same life experiences as your peers.” She elaborated that this meant having “exposure to the same experiences and rites of passage and opportunities that everybody else in the student body has.” Sarah contemplated that this included “school camps or the school excursions, attending rites of passage such as formals or dances or socials.” She said even if students who are blind or have low vision “choose not to participate in social media and those sorts of online things, at least have an awareness of them, so you know what people are talking about.” Advisory teachers shared the importance of interacting with peers, and participating in the social norms of the community, through sport or clubs, which helped students develop social skills.

6.3.2.3. Geographic Location

Students who resided in rural and remote areas experienced barriers due to geographic location, according to advisory teachers/therapists (n = 2). Both Cliff and Barbara, who resided in rural and remote locations, articulated they perceived their schools provided decreased access to services as compared to the capital city of their state. Cliff reported that many of the schools that he covered were “too remote for regular service.” In some instances, restrictions on travel were due to cost. Cliff related an example of when he “had a student who was blind in a [very remote] area and I was being told that I shouldn’t travel there because it was too expensive.” He provided the following scenario, “if a child’s in a rural setting and they get support only once per term, that just inadequate… and this student if they were in the [city], would be seeing an advisory teacher twice to three times a month.”

Barbara reported similar experiences. When asked “What do you think are barriers to curriculum access for students who are blind or have low vision in mainstream schools?”, Barbara considered, “it depends on the context because you see the same sort of needs across the metropolitan area. But the experiences that I’ve actually had in remote settings are quite different.” When probed as to why the experiences differed, Barbara explained “I can’t regularly travel. I can’t pass on the same information.” She reported that it was “disappointing… [as] when you do the comparison with some of the schools in a metropolitan area, it’s very, very different.” Cliff supposed this was partly due to the large geographical size of the state. He explained, for example, “if you drew a 4 hour map full or circle in [another State], I reckon you’d get either 50% or maybe 60% of the state covered.” However, the State where he lives necessitated travelling up to a day to see students “and it’s a really big area to cover.”

The caseload of advisory teachers/therapists was also an enabler/inhibitor in rural and remote schools according to Cliff. He said that he understood “that staffing is tricky in rural areas.” He said when he compared caseloads with his colleagues within the same country he found that:

> Advisory teachers in [another State] they say if you’ve got one or two braille users on your caseload, your caseload is very low. Whereas in [rural area][another AT] and I were carrying 30 kids, or 40 kids, or goodness knows what the number of kids were... it’s just ridiculous to have so many students on the caseload.

Advisory teachers reported that high caseloads and large amounts of travel meant that it was difficult in rural areas to have time to support all their students regularly.

Adequate staffing and training of advisory teachers/therapists, in rural and remote areas, was also noted as a barrier and/or enabler. Barbara explained, “we are really short of staffing and resources in general (advisory teachers) and it is the same for (therapists)”. She expressed concern that due to staffing shortages, “we don’t really have high expectations even of appointing new or beginning advisory teachers.” She shared:

> It’s quite shocking when you think about it, that we don’t really have many people trained on the ground…We are getting people who have no background in visual impairment…and then when you expect those teachers to actually go and provide some understanding or work with the schools as

> students, I feel with setting both the advisory teacher and the students up for failure.

Concerned, for both the students and advisory teachers, Barbara voiced that she was "actually quite angry about that. I think it's not really the students' fault to be actually put into that sort of a situation where it's just about being a bandaid." She contended there was a need for increased levels of support for beginning advisory teachers in schools:

> The comparison I do is when we have the new teachers who are starting really fresh graduates. We have so much support put into place with those teachers for their well-being, making sure that they're really meeting the needs of the students in the classroom. Why it does not apply to the advisory teachers?

Barbara detailed that advisory teachers and therapists could be supporting students inclusive of a range from babies "as young as 6 months and going up to Grade 12." She added that the sustainable development of knowledge for classroom teachers was also problematic as "the population that is actually there in those remote schools or regional schools are transient too."

Being outside the metropolitan area both Cliff and Barbara recognised the importance of staying connected with other advisory teachers and therapists. Cliff detailed that in areas that are "rural and remote you don't have that collegiality." He shared different ways of ensuring this was facilitated, stating he "would discuss cases" with another advisory teacher to get a "second opinion." Barbara shared that although she has trained with her Masters, which specialised in vision impairment, she often "doesn't know the answer. She reflected on her approach to staying connected:

> I have created a network over the course of many years... you have opportunities to meet with other AVTs by Zoom or whatever to discuss any tricky cases that you get… I try to touch base with the AVTs

> in the [capital city], but I will sift through questions on Facebook groups, I also try to find out as much as I can in terms of what's happening in the other states.

Creating connections with other students, with blindness or low vision, was more difficult in a rural area for students, shared Barbara: "unfortunately it gets quite isolated." Similarly, Cliff enumerated "that it is challenging" being in a rural and remote area which can mean "you don't have that opportunity to be in an area with a number of people… especially not on up on a semi-regular basis and not face to face." Barbara furthered that there were no opportunities for her students "to talk to somebody who has a similar eye condition." She perceived that increasing social connection between students, with blindness or low vision, might help: "maybe they would actually love to share their experiences."

Advisory teachers recognised the need to connect with other advisory teachers to gain further opinions and knowledge to support students' learning, which was reported as being more difficult in a rural area. Advisory teachers who serviced rural and remote areas explained that there was a discrepancy in service between geographical locations, which were attributed to the large areas that therapists needed to service, along with staffing shortages and decreased opportunities for social and professional interactions. Barbara concluded, "I suppose it does come down to us not being able to provide the same sort of service."

6.3.2.4. Teachers' Knowledge of Technology

It was also identified that advisory teachers/therapists should have a good understanding of assistive technology to support students to learn the skills necessary for independent access. Carole contended that she "had a good foundation because we used to have a really good assistive technology team and it was great to be able to ask them for input." Barbara hypothesised that in the rural areas it was more difficult, as "they didn't have anybody on the ground,' however, due to her own research, she said she had "a reasonable understanding of terms of what's actually out there right now which is working.” Conversely, Cliff reported that he did not always have enough knowledge about the devices students were using. He explained:

> It’s really tricky when you have something like a refreshable braille machine, and you take that out and you’re trying to get used to how it operates, then you’re giving it to somebody else in the class and expecting them to become able to operate it.

Despite Carole feeling that she had a strong knowledge base in assistive technology, she contended that all students were different and their needs were “forever changing.” She explained that “one challenge I have at the moment…is to try and keep on top of that for my students to keep a couple of steps ahead of in the technology.” She expressed there were lot of different needs within her caseload with “technology skills, braille skills or low vision devices.” Heather agreed that keeping up to date with hardware and software was important and discussed that advisory teachers/therapists should be encouraged to ensure they were up to date with current technology to support their students. In her opinion, “the field has not moved on and technology has. I think we need to be teaching voice activation, rotor, windows touch, 3D printing, and using smart speakers.”

Resources allocated to ensure students with blindness and low vision were able to use assistive technology within the school were also identified as a barrier within the school system. Cliff, who supported students in rural and remote locations, related that “the biggest issue we had was connectivity.” Compatibility of assistive technology to the school system was also a barrier in metropolitan areas relayed Heather. She explained, “for example if you teach a student to use an iPad but the school internet won’t work, or the teachers don’t like them or don’t know how to use them, chances are it will not be implemented.” Cliff reported also experienced this detailing a “most challenging” part of his job is when you set up assistive technology, and “when you come back 4 or 5 weeks later, that bit of equipment hasn’t been used or has malfunctioned, or it’s not in use anymore.” Advisory teachers recognised the role of technology as a resource that could enable or inhibit access to learning for students with blindness and low vision. Advisory teachers/therapists acknowledged their role in staying abreast of technology and ensuring school systems provided support for students to use assistive technology to access learning.

Advisory teachers/therapists expressed that support systems for students with blindness and low vision were barriers and/or enablers for learning. They mentioned the support within schools, from teachers and case managers, along with external supports such as access to expert advisory teachers and therapists. Barriers to accessing support systems were identified when the school could not access a trained and experienced advisory teacher, or when advisory teachers did not keep abreast of assistive technology to support the students' independent access to learning.

6.3.3. Preparing students for Post-School Transition

Advisory teachers and therapists were asked "What do you do to prepare students with blindness and low vision for future employability?" Advisory teachers/therapists identified personal attributes such as confidence to make modifications to access content and the ability to advocate for preferred accessibility needs in the classroom, assisted students to prepare for the advocate for their own needs in the workforce. The stakeholders also recognised skills to use assistive technology independently and proficiency in disability-specific skills were enablers for success as the students transitioned from secondary schools.

6.3.3.1. Individual Characteristics of Students

Advisory teachers/therapists (n = 4) identified that it was important to build the confidence of students with blindness and low vision, so students felt empowered to make their own adjustments in school and future employment. Terry agreed it was important to build both ability and confidence for students to ensure independent access to the curriculum. He shared:

> If an educator hasn't provided accessible materials, or the software crashes… if things don't work at the end of the day. If they have the confidence, that is easy enough to take forward and move with. But if they haven't. It's about building that.

Carole agreed that confidence was an enabler for success for students with blindness and low vision to independently access the curriculum. She said students needed to "understand their own vision and have some confidence in themselves as a young person." Advisory teachers/therapists discussed that this confidence could also help students to be able to articulate their needs in the classroom, leading to increased success, which was important going forward into the workplace. Carole reported it was a barrier to future employment when adults suggested modifications for students in secondary and shared situations where students may enact these modifications, even if they are not the most effective for their learning.

From Heather's perspective, classroom teachers should be preparing students to think through curriculum accessibility problems, by asking for student input into modifications for content and assessments. Heather suggested asking questions such as "we are doing this assessment how would you like to do this? Hey, we are having difficulties making graphs—how would you like to solve this?" While Heather supported that student involvement in modifications was an important enabler, she also claimed that a focus in secondary should be to explicitly prepare students to have the confidence to make modifications independently. She explained that her "job as a teacher, is to give them skills to when they go to university and workplace, they can do anything with the skills they have." A student's confidence to make their modifications and advocate for their own needs in the classroom was seen as an enabler to access learning and prepare for future employment.

6.3.3.2. Technology as Both an Enabler and Barrier

The ability to use suitable technology was supported by advisory teachers/therapists (n = 4) as an important tool to prepare for the transition to further education or employment. According to Barbara, the correct technology tool made “access easier and the learning becomes even more enjoyable.” However, the stakeholders also noted it was a barrier to success when students were unable to independently use assistive technology to access the curriculum. The importance of technology as a tool for independence was recognised by Barbara, who stated that technology can assist students to access the curriculum without relying on other people. However, Barbara shared that to be independent with using technology, it was important to explicitly teach students how to use technology and for students to have access to the most suitable equipment for the task.

Barbara shared an example of how she initiated teaching the use of assistive technology to a student who was losing her vision: “it took me 2 years basically just to make that progress from going from paper to everything digital.” Barbara shared that the student now feels “very proud and happy that she is one of those students with adaptive technology. She does everything online. So OneDrive, OneNote, touch typing.” She elaborated, “one of the interesting things I heard from a student, was that they were pleased that they’d learned the technology when they were young, because now when they’re getting into senior secondary, it hasn’t been as daunting.”

While understanding the usefulness of technology, gaining access to technology was potentially an inhibitor for some students. For Barbara, in a rural and remote area, she found access to technology was “an ongoing battle, I think mostly because the resources are not readily available.” Barbara deemed it important to conduct a substantial trial prior to deciding on the equipment that the student would need going forward. She articulated that external agencies allow families to “come and look at the device and within 60 minutes, a decision is made that this is going to be the device for you.” She argued choosing technology is a lot more in-depth, so she likes to assist families with this decision:

> I normally do my own research, which is around making sure that I know exactly what’s there. Is it going to really work for my students? I do have to

> consider the variables around it in terms of the school setting, the staff, the student itself and the family and the cultural context behind it too. I actually organised some trials through the suppliers and try them with my students and ensuring that I do have a good understanding myself.

Heather recommended that "inbuilt accessibility options in mainstream technologies" should be considered when thinking about assistive technology for students with blindness or low vision: "for example why use dragon dictate when they can use voiceover on iPhone?" She discussed that this provided a more inclusive approach "as digital technology is not just for the vision impaired, it needs to be included for all." Heather expressed her view that students, with blindness or low vision, "should have the tools to access everything others can—online searches, different websites, organise apps, organise files, have skills to navigate and access inaccessible documents." Similarly, she detailed electronic braille devices should be considered over printed braille: "digital braille is the key to the future, not paper braille. It allows it to be immediate rather than have to have everything printed" which she contended "is important for real life and uni and employment—the end goal." Advisory teachers/therapists identified the importance of assistive technology to enable students to access work independently and at the same time as their peers. Mainstream devices were recommended as being more inclusive with peers than technology specific to blindness and low vision.

6.3.3.3. Disability-Specific Skills

Advisory teachers and therapists claimed an important part of their role was advocating for the inclusion of disability-specific skills, which they expressed was an important enabler to students developing independence in accessing the academic curriculum and preparing students to be independent after completing school (n = 4). Disability-specific skills were said to be required to assist students with blindness and low vision, to access incidental information that others can see through vision. Sarah elaborated that teaching disability-specific skills was important to start when students were young. She explained:

> If students have not worked across all areas of the [disability-specific skills] throughout childhood and adolescence, and that there are areas of learning where there are gaps in those last few years of high school. It's very difficult to catch up because there are so many academic pressures that are coming up.

Heather enumerated that for students with blindness or low vision part of schooling, was to support students' transition to employment: "to scaffold, fill in the missing gaps and provide them with skills to succeed." When asked specifically what information might be required transitioning to employment, she elaborated:

> So understanding financial management, bank accounts, understanding workplace structures and hierarchies, they haven't been able to just watch it incidentally, then there may be some gaps in their learning and knowledge about what their peers have just been learning about their whole lives. But for some of the students I've worked with, they have missed that. If it hasn't been explicitly explained to them, things like completing paperwork, completing forms, doing signatures, all of the stuff that happens when you're in those later years of high school, it's that time where it starts to come up because you're needing to look for information online, that's not just being provided.

The importance of the disability-specific skills for students in secondary was echoed by Carole, who resonated that for students to be successful in secondary, "[Disability-specific] stuff has to be in place and they need to be able to express it really well, a realistic amount of time, and what they need to acquire those skills and to master those skills." Carole also shared that the disability-specific skills provided "important things that you need to know to get on in life" however the biggest "conflict" she had with people in schools, was when they could not find time for the disability-specific skills as they contended they need to do the academic curriculum. Whereas in Barbara's opinion, the disability-specific skills were "equally important, too, as part of learning, as part of actually going and stepping into that adulthood phase and getting ready for university".

Skills to use technology independently and disability-specific skills to prepare for independence in the workplace, were also identified as an enabler for future education and employment. The next section outlines the perspectives of the policy-makers that make decisions around resources and staffing to support students with blindness or low vision.

6.4. Findings: Policy-Maker Perspectives

The participants considered as policy-makers: Jorge, Nabel, Monique and Archie (Figure 6.3), are leaders of education departments or decision-makers in an organisation that impact students who are blind or have low vision. The results of 118 references from interviews with the four participants were themed as a) impact of blindness and low vision on learning (n = 15), b) partnerships and resources to support students within schools (n = 52), and c) preparedness for post-school transition (n = 51).

Policy-makers	Jorge Nabel Monique Archie

Figure 6.3 Anonymised Participants: Policy-Makers

6.4.1. *Impact of Blindness and Low Vision on Learning*

Policy-makers (n = 3) discussed the impact on learning from loss of vision. Policy-makers also discussed a) catering for inclusion in the classroom, and b) access to subjects and examinations.

According to Archie, for a student who had lost some, or all of their vision, the influence of "a profound vision impairment is pervasive and it impacts probably every area of a child's life." He said it also "impacts their learning because of that lack of incidental learning that they're unable to do." Archie also shared that students who are blind or have low vision "lack watching and having something modelled to them through vision and so that limits their concepts and their conceptual frameworks, which then impacts in school." Archie noted, "it depends on the student because obviously a student who has a mild impairment, schools will feel more comfortable and more confident about making adjustments for that student." However, from his experience making adjustments for other students required access to external support, "especially if it's a severe to profound vision impairment, they won't have had a student like that previously in their teaching career." However, Monique related that in her experience it was the opposite, that students with low vision were not as visible, and therefore low vision could be a barrier to learning. She explained:

> If the disability is visible, it's front of mind …but if they've got low vision—they're the ones that are much worse off. We spent so much time with the kids with severe vision and blindness and we really need more focus on kids with low vision.

It was recognised by policy-makers that blindness and low vision impact a person's access to learning.

6.4.1.1. Catering for Inclusion in the Classroom

Teachers being able to cater for the individual needs of students with blindness or low vision within the classroom were considered an important enabler to learning. Monique said that many schools were currently more inclusive: "schools are doing much better these days than in my generation, or yours, in embracing diversity." For Jorge what worked well in her experience, was having a "teacher who's particularly knowledgeable around how to make sure that that education is accessible." She said an enabler to curriculum access was when "you've got a fantastic teacher or you've got a fantastic head or support teacher" who was "thinking about how [to] be genuinely inclusive in a classroom. That's been really productive." Nabel was concerned that many teachers "seem to do a few things that kind of get them through as opposed to finding a way of making them thrive." Whereas, he said, students who are blind or have low vision, they have specific needs in the classroom. He shared that an enabler was "an absolutely customised approach that puts [the student] in the centre of what's happening and says their success is the most important thing." He explained how this could work:

> If a teacher at the beginning of the year said "This child that I have joining my class, who has got low vision or is blind, isn't an anomaly or a difficult situation to deal with…" It *is* a special situation to deal with and we need to find a way that that student can get the best out of the year. I'm going to work with a specialist teacher for the vision impaired to set that up.

Focusing on the student and recognising their needs to be included in the classroom was recognised as an enabler by policy-makers to ensure equitable access to learning.

6.4.1.2. Access to Subjects and Examinations

Barriers to success for students with blindness or low vision in access to specific subjects and external examinations were identified by policy-makers (n = 3). Archie shared that the "visual concepts and the increased complexity of the visual concepts in secondary increases." As a result. "I've seen students and heard many stories of very capable students who drop subjects that they are intellectually capable of doing because of a lack of access." Archie explained this might have occurred because students "don't have the right learning materials, maybe because they don't have access to a specialised teacher." He advocated it was an enabler to success when students have "the right adjustments at the right time, the right learning materials, high-quality learning materials and accessing education on the same basis as their peers." He shared the story of a student:

> She had done Year 11 maths methods and could do it and was very competent but she was using the braille calculator in her braille note. And that was very limited for maths methods. So she was going to drop it in, until the advisory teacher came and talked to her about it and trialled a scientific calculator with her. It actually is something so simple but because there was just someone who had the knowledge and had access to the equipment and taught her how to use it and now she is succeeding in Year 12 Maths.

External examinations were raised by both Jorge and Nabel as possible barriers to success for students who are blind or have low vision in mainstream secondary schools. Jorge shared "I've heard a lot of anecdotal evidence around how the exam situation … a lot of the national examinations like NAPLAN, really haven't been thought through from access perspective." She said this resulted in unfair results for students, where they have "to cope with both the disadvantage of the results and also the anxiety around anticipating what that might be like." Nabel contended that the purpose of examinations should be "trying to make sure that [students] succeed, that they can best describe their knowledge to the people marking the exam." He was concerned the way external examinations were set up meant students, with blindness or low vision, had it "stacked against them." He perceived that the external assessment organisations considered "why would I put so much effort in for so few students? The approach at the moment seems to be, oh, yeah, she's got low vision. She can do this and this only, which might not be the best way of doing it." Nabel advocated that conversely, students could be asked "how do you best perform an exam? What technology do you need?" He said then the external organisation can apply "the equality overlay over that to see that they're not getting an advantage over others or not able to cheat." Policy-makers recognised that certain subjects and external exams were more difficult to access for students with blindness and low vision. Stakeholders suggested that content and assessment processes should be set up to ensure students with blindness and low vision have equitable access to their peers.

6.4.2. Partnerships and Resources to Support Students Within Schools

Partnerships and resources to support students with blindness and low vision were identified by all policy-makers (n = 4) as a barrier/enabler to curriculum access in mainstream schools. This was verbalised by Nabel: "overall, the problem is in the resourcing." Resources included financial resources, knowledge for teachers, access to qualified and trained specialists and time: "the challenges at the moment are for me as a [policy-maker] is you're limited in terms of staffing and equipment and money and you know what, all sorts of things" (Archie).

6.4.2.1. Financial Resources

In terms of providing access to financial resources necessary to support students with blindness or low vision in mainstream schools, Archie reported that "there are challenges sometimes with setting up for our profoundly vision impaired students or students who are touch readers". He stated this was due to the “challenges around the cost that entails and schools struggle with paying that.” He advised that within the State, schools are provided funding for students with disabilities and therefore it is “the responsibility of school for that equipment.” Archie reported that in his experience, there was variability in how schools responded to the needs of the students: “some schools will just buy what they need and set up for their student. Other schools don’t see it as their responsibility.” Policy-makers shared that financial resources support students with blindness and low vision within schools and classrooms, however, there was variability in the distribution of resources between schools.

Resourcing within the classroom was also noted by Nabel as an enabler and/or inhibitor to learning. Nabel said “teachers are dedicated ... and genuinely trying to go in to do a good job” of accommodating for the needs of students within the classroom, but this was “difficult because teachers are under-resourced,” which he was concerned created a barrier to success for students with blindness or low vision. “I think [teachers] are a product of their training and the product of the resources that they’ve got.” Nabel perceived that teachers were not given an opportunity to make a difference due to inadequate class sizes: “it seems to me that they set up to fail—our classroom sizes are huge.” He contemplated that “if a child with low vision joins the class, should classroom size being reduced by five children to give the teacher more time to customise their approach to make sure their student succeeds.” Policy-makers were aware of the efforts made by classroom teachers to support students with blindness and low vision and identified large class sizes as a resource barrier, that may impact learning for students with blindness and low vision.

6.4.2.2. Access to External Advisory Teachers/Therapists

Access to advisory teachers to support schools was also considered an enabler and/or barrier by policy-makers (n = 3). Archie found experienced teachers as “generally very welcomed in schools because vision impairment is such a low incidence.” Usually, advisory teachers spend time with teachers, and administrators, in schools sharing information about suitable modifications and access, Monique explained. Archie said barriers existed from the "lack of qualified, experienced staff that we have in this state, and so access for students to experienced qualified staff is limited." Archie also noted, "the further away from the capital city, and for the most from the most populous area, the harder it is to get qualified staff." He considered access to qualified staff more of a barrier than financial resources, and expressed that it was difficult to recruit skilled advisory teachers within the state:

> I can create a role in my team and I might have the funding and all the equipment that's needed for that person to do their job. But there may not be anyone who has the skills to do that job ... and then it's often someone who has no qualifications or experience. So that's one of the big challenges at the moment.

Similar concerns "of recruitment of teachers who are not qualified and they are trained on the job" were evident from Monique. She stated that historically the State has offered "a scholarship system for the Masters in Sensory Disability with [University]. Then they did away with that because it was too costly." She said that changes in the funding model resulted in having "not many people actually apply, due to they have got to cover the fees [sic]." Monique shared that this was not isolated to just one State or Territory and related that in a recent meeting of Australian wide policy-makers, the recruitment of qualified teachers was "raised in the discussion." She explained:

> It's happening across Australia that people are going into the specialist vision profession with no qualifications and limited experience in the field, being mentored by people who are in a similar boat. Now, this works well if they're trained by people who've done a masters who've got the background, but those people are now retiring…so they're just mentoring them with what they've learned

> themselves. You’ve got a dilution within what was a fabulous system that was working well.

High caseloads for advisory teachers were identified as a barrier to student success by policy-makers (n = 2) as they resulted in decreased service for students with blindness and low vision. According to Archie, “not only do we not have many qualified teachers, but they have very large caseloads. So the access for students to a qualified person is very, very limited.” Monique shared that an enabler to success is when advisory teachers and therapists “have reasonable caseloads.” She said some advisory teachers “can have 64 kids on [their] caseload.” She explained that particularly if some of these students were learning braille, it proved difficult to provide sufficient service. She added that “what works well is when you’ve got qualified specialists who’ve given low caseload so that they actually can provide a quality service.”

Using teacher aides to support students, rather than rely on classroom teachers and advisory teachers, was also recognised by Monique as a barrier to student success. She explained that many schools would hire a teacher aide to support students using braille, and the teacher aides would have “expectations on them because teachers are so busy, especially in high secondary school.” She related that she would “run these teacher aid trainings and we hear it from these poor souls who are expected to cover all the specialist areas.” Furthermore, Monique was concerned that not all schools were understanding the importance of the advisory teacher/ therapist, and instead chose to use “teacher aides to fill the gaps. Schools are choosing to have a teacher assistant funded rather than bring in the specialist vision teacher.”

Geographic location was recognised by policy-makers (n = 3) as a possible barrier to advisory teachers and therapists providing support to all students, “especially when they have to travel long ways” (Archie). Monique added that Advisory teachers and therapists could travel “an hour on the road to get to school for a student, that’s either not there… or you’ve got limited time, and then on the road to somewhere else.” Archie advised, as well as the long distances advisory teachers and therapists were travelling, geographic location brought additional barriers due to difficulty in staffing, and high caseloads. He shared that the State she oversees, had access to qualified staff, however, there were many challenges identified for these staff:

> We're very fortunate that we have a couple of excellent qualified staff, quite rural. But that also brings real challenges for them because they are the qualified person in the whole region. And so that then becomes a really big job for them as well as doing their caseload of students and doing everything that's involved in that. They're also then trying to mentor staff who aren't skilled and aren't qualified.

Monique suggested the learnings from the Covid-19 pandemic might assist with new ways of working to support students in regional and remote areas. She expressed it "works well in the current environment is this blended delivery model, so that specialist V.I. teachers can train up staff, share their knowledge using an online mode."

Policy-makers shared that advisory teachers/therapists enable access to learning for students with blindness and low vision, through providing specialist knowledge and information on how to make adjustments in schools. Barriers to access were identified for when advisory teachers/therapists are not qualified, have high caseloads, are replaced by teacher aides or students are in geographical locations which have limited access to advisory teachers/therapists to provide specialist support for students with blindness and low vision.

6.4.3. Preparedness for Transition

According to the policy-makers, preparing students for the transition to tertiary education and employment was important for students with blindness or low vision in secondary. Policy-makers identified skills such as independent curriculum access, access to braille or appropriate technology and training as enablers to learning. Focusing on developing independence and agency, along with preparation for employment Policy-makers considered that education played a role in preparing students for the transition post school. Policy-makers identified the influence of a) curriculum access, b) individual characteristics of students, c) support to develop employability skills, and d) disability-specific skills.

6.4.3.1. Curriculum Access

Policy-makers identified the importance of academic success for all students in secondary. Archie reported, “academics are very important, in order to be able to get into uni.” Monique said the key enabler was to consider if students with blindness or low vision were “prepared to be completely independent in a mainstream setting?” Monique related that “several years ago, there was a Senate inquiry into students with vision impairment entering the higher education field.” She shared that “the issues that they discovered were all around preparedness for a higher education… independent use of technology, independent use of multimodal formats, access to educational experience” She explained this meant, “in terms of higher education, being able to independently access both the environment, the lectures, the content, the books… which may or may not be in their preferred format.”

Access to braille was also identified as an enabler to literacy success for students who are blind, however, according to Monique, it was not necessarily being promoted for use of students by advisory teachers. She hypothesised one reason for this could be because there was a reduced number of teachers trained in braille: “so much is happening in the digital space now and teachers aren’t learning braille. But if you have a student who really wants braille, what happens?” Monique contended, despite other digital technology being available, that braille was still relevant for students who are blind. She said the “cognitive load if you have to remember everything through audio format …just to listen and then be expected to recall to transfer that into hard-core memory is really challenging.” Monique related that it was still possible to have curriculum access using audio and screen readers, but audio alone did not support the full literacy development of students. In her experience, students who used only audio resulted in students not gaining access to all elements of literacy. Monique explained, using audio only, relied a lot on memory and meant “you can listen and you can use audio narration, but you can’t edit or punctuate, you can not read and write.”

Access to appropriate technology and training was identified as an enabler or inhibitor to independent learning for students with blindness and low vision. Knowledge of available technology to assist students to access information, was considered an enabler by Jorge who posited “an awareness of how you keep on top of what some of that access technology is massively important to assist students.” Jorge shared that there are many different types of equipment available to support access to learning which, if students have access to them, create enablers to learning, specifically: “braille machines, and different versions, JAWS and other text to speech technology.” Nabel experienced that a barrier to gaining skills to access technology may have arisen when teachers failed to introduce equipment as they were “mature teachers” and not able to keep abreast of “advanced technologies… meaning kids know more about technology than teachers do.” The use of braille and assistive technologies were identified by policy-makers as important skills for future employment so students could independently access the content.

6.4.3.2. Individual Characteristics of Students

Promoting independence was considered an important “skill set” says Monique, that students with blindness or low vision “need for higher education and vocational opportunities in whatever if they want to be.” Monique shared:

> The biggest disadvantage you could ever do for a student is provide them, spoon feed them, their textbooks in large print, because when they leave school, they’re not going to have any large products. So they don’t learn how to use these devices to access print in the format that they need.

Independence was considered important for preparation for employment. Jorge posited that employers "want good employees and so that's someone who can be independent and doesn't rely on other staff members to do lots of things for them." Monique added to this that "orientation and mobility [skills] for total independent travel" was also important for employment. She related that there was great difficulty for people with blindness or low vision in gaining work, which she contended "the biggest challenge is the mindset of employers". How on earth do you shift those prejudiced views?" Monique shared that employers still put up barriers to employment. She explained why this may be the case:

> Because vision impairment is such a low incidence disability, you don't see a lot of people in the workplace with vision impairment. So employers just take the easy course. You know, there are so many adjustments we've got to make to this person and technology and how are they going to attend the meetings and how they're going to...and it's easier just to quietly choose the sighted person who may be less skilled and less qualified.

Agency in learning was an important skill to prepare students for employment, according to Archie. He related that students who had "independence, can make the decisions around what tools they use for particular tasks, in particular subjects." He experienced it as an enabler when students with blindness or low vision were able to "problem solve, to be independent, to take responsibility for themselves." Archie added that independence was important "so that it's not the teacher aide who gets a C or above, it's the student who gets a C or above." He posited that it was a barrier when teachers, or aides, completed the work for students as it was not preparing for future education and employment if they "think they're so good at stuff because their teacher aide did it for them." Jorge contended that a person's independence, "comes down to the teachers and the parents as well and how they supported." She experienced it worked well when parents, and teachers, "don't cotton wool the students or their children, and have high expectations.” Policy-makers identified independence in accessing information, orientation and mobility, and agency to make decisions about accessibility needs, were enablers for students with blindness and low vision in preparing for further education and employment.

6.4.3.3. Support to Develop Employability Skills

Focusing on a transition to employment, within schools was identified as an enabler to success by all policy-makers (n = 4). Due to difficulties in gaining employment for people, with blindness or low vision, Nabel discussed this as important for secondary students, with blindness or low vision, in that it “prepares them for the workplace for a level of productivity that’s the same or better than their sighted peers.” Archie contended that it was integral to success for students to leave school with “skills and abilities they need to be employed.” He said these employability skills were considered as skills needed to access information, personal skills to work hard and work with others. Archie explained these were important as they “not only impact their education but impact their life and set them up for success.” Monique voiced strongly that inherently the success of schooling was related to a successful transition process to future employment.

Monique added that an enabler in the preparation to transition to employment was “really good career counselling.” She voiced concern that “mainstream careers advisors, who don’t know anything or limited information about sensory impairment”, were advising students with such specific needs if they were “equipped and do they have a range of jobs that they can put on the table which offers career paths for these kids?” Jorge shared some programs recently were offered by external providers that had a “focus on employment.” She detailed these offerings were “really aimed at elevating young people above and beyond their peers” and provided specific information for people with blindness or low vision which, according to Jorge has “been a really positive opportunity for a lot of people.” Policy-makers identified career counsellors and programs that were available to support students with blindness and low vision assist students to prepare for employment.

6.4.3.4. Disability-Specific Skills

While Archie acknowledged that skills for employment are "not just for students who are blind or have low vision" he said that for this group of students, there are "compensatory skills need to be taught from the early years." He said these disability-specific skills, required to compensate for visual information, are skills that their sighted peers collected incidentally. Archie related that "the expanded core curriculum not only allows access for the student to the curriculum, but it teaches the skills and abilities that they need to be employed." Jorge suggested social skills for sighted students were developed through "opportunity: sitting around at that school-aged space." She related that group activities such as "goalball and some of those sports groups" helped students to develop "some of those particular connections." She further added the importance of social skills extended beyond the person and enabled people to think about others and feel valued. She contended "good social skills" were an enabler to success, "so that it's not all about the person themselves, but they're contributing to a team." Monique added that these included "social skills, independent living skills, and self-efficacy" and are an important part of the Expanded Core Curriculum which prepared students with blindness or low vision for transition to employment. Archie asserted that within schools students needed to interact with their peers. He said that it was "very important that there's connectivity for our students and that they have connections with other students who are like them."

Monique said that despite the importance of disability-specific skills to ensure students with blindness or low vision have more equitable access to employment, she said classroom teachers asked "where do you squeeze them into a full curriculum?" She explained, "I think what happens in the secondary is so much curriculum content to get through the often the expanded core curriculum areas are overlooked." This seemed to be similar for Archie, who posited the academic curriculum and the expanded core curriculum "has to be taught at the same time for inclusive education."

Policy-makers expressed students need to be explicitly prepared for the transition to further education and employment while in secondary school.

They indicated that independence and access to disability-specific skills helped to build positive characteristics toward future employment.

6.5. Summary

This chapter examined the perspective of the educators interviewed, which included teaching staff: classroom teachers, support teachers, a teacher aide, advisory teachers, and therapists, as well as policy-makers who made decisions regarding resourcing within education systems. Educators identified enablers for students with blindness and low vision, such as independent modifications to the curriculum so students had access to content. They shared support from classroom teachers and support teachers within the schools but identified external advisory teachers and therapists who provided the expertise around blindness and low vision. Teacher pedagogy and beliefs that accounted for the impact of blindness and low vision, along with the explicit teaching of disability-specific skills, were considered enablers for students with blindness and low vision. Access to technology, and providing skills to use technology independently and attributes such as confidence, independence along with family support and peer interaction, were identified as important for students with blindness and low vision by the education stakeholders. Advisory teachers/therapists posited that students provided with opportunities, responsibilities, and realistic aspirations were more likely to experience success in future employment.

Difficulty in accessing assistive technology through school systems was identified as a barrier by advisory teachers, along with opportunities to trial equipment to identify if it was suitable for individual students. It was also purported that advisory teachers/therapists needed to remain current with technologies, including inbuilt accessibility in mainstream devices, to support students and teaching staff. Accessing adequate training for students with blindness and low vision in making modifications and using technology to minimise dependence on family members and teachers, were identified as impacting future success.

This chapter examined the education stakeholders' perspectives of barriers and enablers for students with blindness and low vision in mainstream schools. The next chapter examines the perspectives of parents, people with lived experience, and the employment consultant/employers.

Chapter 7. Findings: Additional Stakeholder Perspectives

7.1. Introduction

Chapter 6 outlined the data findings from the perspectives of educators who work with or make decisions about the curriculum, pedagogy, and learning environment for students with blindness and low vision in mainstream schools. This chapter explores the research question: "What do a range of stakeholders perceive enables and inhibits curriculum access for secondary students who are blind or have low vision?" The participants included: parents of the students with blindness and low vision, people with lived experience of blindness and low vision, and the employment consultant/employers responsible for recruiting employees. These stakeholders are considered important components of the entire ecosystem, as outlined in the Conceptual Framework in Chapter 3. The next section shares the findings of the perspectives of parents of the students introduced in Chapter 5, followed by views of persons with lived experience, then followed by the employment consultant/employers.

7.2. Findings: Parent/Carer Perspectives

This section outlines the perspectives of Louisa, Millie, Natalie, Amanda, Simon, and Andrew, parents of the students interviewed in Chapter 5 (Figure 7.1). All parents were interviewed individually and afforded insight into their perspective of education experiences for their child with blindness or low vision. Parents identified barriers and enablers, from their observations, such as: choosing mainstream schools, making modifications, access to technology, and students' personality attributes, which impact learning within mainstream secondary schools. A total of 197 references were coded into NVivo under the themes: a) modifications and support within the mainstream school context (n = 60), b) access to technology (n = 34), c) students' individual characteristics (n = 47), and preparedness for employment (n = 56). This section reports findings from interviews, undertaken with parents of students with blindness and low vision (6) which were categorised through NVivo as modifications and support within the mainstream secondary school context.

Parents	Louisa Millie Natalie Amanda Simon Andrew

Figure 7.1 Anonymised Participants: Parents

Mainstream schools were described by parents as schools where all children can attend, including those with blindness and low vision. The parents in this study chose to enrol their students in mainstream education because they lived in the locality of a mainstream school (n = 4) or had other children already at the mainstream school (n = 2). Andrew explained his decision-making process in school selection:

> Certainly when Kye was born [they] went into [early intervention], then interestingly we were looking at [primary school], with a specific vision unit that in the end, we found he was better off in his local mainstream school, more in [their] locality.

When probed why the locality was important, Andrew explained being in the local school would “foster local friendships and connections” as well as being practical in terms of “logistics and convenience” for his family. Simon reported that he chose mainstream education for the diverse environment of students who make up the school population:

> I just like the inclusivity of it all. It’s equitable as well. And it’s also teaching the mainstream school, and then all of the participants in the in a school

> environment, about diverse kids …I think it's very crucial in highlighting differentiation as well.

Natalie explained that the decision to put her child in mainstream education was difficult, as her child had additional sensory disabilities, with a hearing impairment. She and her then-husband, discussed which school their child would attend. They decided for their child to attend a local high school, which had a good reputation for disability support. For Millie, choosing the right school for her child had "been kind of a rollercoaster":

> Chris went to a school which had a unit of visual impairment and [they] had support in and out of the classroom … but then Chris found it overwhelming. Towards the end, I guess part of it, I think, was social, where Chris felt as if [they] stuck out. [They] didn't want people to watch [them]. Chris became very self-conscious with the way [they] needed to learn and what [they] needed to do to access to learn. So it was quite difficult.

Andrew also found it difficult to select a secondary school that was willing to take his child and support them. He shared that said he wanted to send his child to the private school, where he had attended as a student, however, reported that "the Principal at the school said they did not feel comfortable as they were not set up for a blind child." So he decided to send his child to an alternative Catholic school. According to Andrew, this new school had been very accommodating and inclusive. Each parent shared their challenges in choosing the right school for their child, indicating the importance of school selection for parents who have children with disabilities.

7.2.1. Modifications and Support Within the Mainstream School Context

All parents (n = 6) were aware that their child needed specific modifications in terms of alternate formats of content, pedagogy, and the learning environment to enable access to the curriculum and its associated resources. Examples noted by the parents, included using screen readers, magnifying tools and/or use of braille. Additionally, all parents reported that they had been involved in Individual Education Program meetings with teachers within their respective schools. These meetings focused on the required modifications needed for their child to access the curriculum.

Millie expressed that the subjects her child was doing in secondary required a significant amount of reading. She explained that:

> [T]he material that [they have] to read, articles … [they] simply can't read them. It's too fatiguing for [their] eyes. So [they] do need to use text to speech … [they] use big headphones and [they] have airpods (sic) as well.

Millie shared that even though it was difficult for her child to access the curriculum (e.g., do lots of reading) there were some options for them to access, such as text to speech software. Similarly, Simon explained that from his experience, he was concerned about the "wealth of material [they] are expected to read and the additional time to be able to access the curriculum." For this reason, his child is completing school via "variable progression. So [they]'ll be completing senior over three years." According to the Queensland Curriculum and Assessment Authority (2018), variable progression accommodated students' needs by allowing students to spread their senior years over a longer timeframe, to allow a smaller academic load each semester.

Natalie shared that her child had a support teacher, or teacher aide, in class "all the time" to assist them to access the curriculum. She said, "there's not that inclusiveness because there's an adult body with them all the time." She expressed her opinion of secondary curriculum for her child who is blind, with additional disabilities by stating "it's all very fast-paced, especially in the senior years. And then if you put in another impairment on top of the vision … I guess it ends up in it from our perspectives that [they] have missed out." When asked what her child had missed out on, Natalie elaborated that teachers had told her "[they] won't need that on the exam, [they] don't need to do that because we can't really get them to do that" and therefore she said her child did not participate in the same content as their peers. Natalie expressed that not including her child in an activity was "not the expectation and not the same experiences."

Similarly, Louisa spoke about her child missing out on the visual curriculum. She shared "a lot of the curriculum is really very much multimedia now. So, there's a lot of digital images and things that make it really hard." She explained further: "they show a YouTube clip of that and forget that there's a child [with blindness or low vision] in that classroom. So the kids are listening to the reactions of all the kids and the [student with blindness or low vision] doesn't know what's going on." Amanda, whose child was completely blind, also identified some visual content as difficult to access. She discussed the school learning management system which "doesn't work because it's all graphics." However, she was aware of many adjustments that were made for her child which meant that "[they] really don't miss out in terms of everyday school." Amanda reported that her child accessed information through JAWS [screen reading program] with focus 40 [electronic braille machine] and a Perkins [manual braille machine]. "Handouts or stuff like that may, or may not, have in place and it might be brailled up at a later date and then given to [them]."

Louisa also reported that modifications were made for her child to access the curriculum. She shared a positive learning experience for her child, where:

> The teacher just read everything he's put on the board. This is the first time…that someone's been inclusive, that she really hasn't had to worry about any extra materials being sent to [them] …because [they've] got it, and [they] can copy it down, and understand. And it doesn't take that much extra, does it, just to read it out?

Parents were also aware of modifications (n = 4), from supporting their children at home with homework, preparing assessment, and during periods of home-schooling throughout lockdown periods during Covid-19. While Andrew expressed that many modifications were made for his child to access the curriculum, in his experience, there were some things that schools did not automatically think about in terms of modifications. He expressed that it seemed "you have to request more things, ask for more things." In his opinion accessibility was difficult for his child. He said, "the assessment, the explanations, will be a challenge." Millie, whose child had completed school through Distance Education in 2020, stated that learning was more challenging for her child due to the accessibility. Millie also noted that her child received "a lot of material via email and [they are] kind of expected to troll through it sometimes because the teacher can't adapt at all for their needs… I need to support [them] a lot." Simon reported that his wife had to provide additional support at home to support his child with blindness and low vision. He reflected, "it's an interesting issue in the terms of autonomy." The examples highlighted that though the students were receiving some support to access curriculum materials it was not enough for them to work independently, as parents still had to provide extra support for their children.

From the parents' perspective (n = 5), barriers existed in relation to participation in specific curriculum subjects. For example, Amanda shared that her child had difficulty with "maths, it's quite a visual subject and it's quite challenging." She elaborated on the process of supporting her child, who is blind, with subject selection:

> Normally you do quite intricate academic subjects like chemistry and physics and all those things and they are quite visual again. So, do you choose those subjects or do you go more humanities base, which, for a blind person tends to be a lot more accessible and also easier to do because it's all there and audio books and all those things are available.

Natalie also said there were subjects that were more difficult to access because the content was too visual, “for example coding.” She explained this was problematic as “kids need coding.” She discussed longer-term implications of missing out on a subject: “then you get to TAFE or whatever there is an expectation of a knowledge of a particular subject.” Natalie provided an additional example of learning activities where videos were shown in class: “I might get an email that says all the students are watching such and such show next week … I give consent. But is there audio description? No.”

Louisa related that physical education, and areas where students interacted, were less accessible to students with blindness and low vision. “Physical education and those sorts of physical icebreakers or team building, that sort of thing is particularly bad, I think they just say, oh, that’s right, you can sit on the side [or] something and not participate.” Simon was concerned about accessibility in psychology, due to the amount of reading. He expressed that there “were 44 case studies that students have to have to be on top of in terms of that information to answer, for the external exam questions. So it’s a lot of reading.”

Louisa, who had two children with legal blindness, one in Secondary, related that in secondary schools the teachers rotate through classes and rarely get to know the students. She stated:

> I just think probably the lack of experience the teachers have, to know exactly what the child needs. … So a lot of time, I think they get left behind because of the teacher’s inexperience. And yet they have the ability to know what to solve, once there’s acceptance of it and the way they do things. … Some teachers are more willing to put a lot of effort into that than others, you know, I think it’s pretty much an individual teacher thing.

Natalie also expressed concern that there was a lack of understanding of teachers and also “time constraints of being able to get the resources available.” She elaborated that it often meant “another person needs to be involved and then because of time constraints, [the support teacher] is just like, oh well, I’ll just do that. Then the teacher doesn’t learn.” Parents identified that many modifications were being made by the classroom teachers and support within the school to support learning.

All parents (n = 6) reported the school had a support unit in the school to assist teachers to prepare resources for students with disabilities. Natalie, Amanda, Millie, and Simon, stated that there was a support teacher within their child’s school, with knowledge about blindness and low vision, who assisted the teachers to make adjustments. Louisa and Andrew had an advisory teacher who visited their child’s school, at least each term, to support the classroom teachers with making adjustments.

Parents (n = 2) mentioned barriers and enablers of mobility within the school environment. This included the physical environment of classrooms and schools and the ability of students to independently travel within the school. Amanda related that navigating through a classroom was more difficult for her child:

> It’s a lot harder to manoeuvre around in a classroom and things like that because nowadays they’ve made classrooms quite versatile. As in, they want them to move around, particularly if they’re doing experiments and those kinds of things. But [my child]’s pretty good. They will just grab hold of someone’s arm.

The parents interviewed shared information that they claimed enabled and inhibited their child’s curriculum access in secondary. These included modifications to the curriculum, support from teaching staff within and external to the school, and modifications to the learning environment.

7.2.2. Access to Technology

Parents identified types of technology that students with blindness and low vision use to access the curriculum. All parents (6) reported that their child used technology to access the curriculum both through mainstream technologies (such as phones, tablets, computers, and built-in screen reading software) and assistive technologies (including eBraille devices and JAWs screen readers). The parents interviewed in this study had access to their own technology such as smartphones (n = 6), laptops or computers (n = 6), iPads (n = 3), Google home (n = 2) and some vision-related technology used by their child (n = 2) such as a braille machine and a talking microwave. Parents (n = 2) further elaborated that they were "not particularly technologically savvy" (Amanda) or "not a really big techno person" (Natalie). Others (n = 2) were keen to embrace technology, such as Louisa, who found technology such as Zoom, "really fantastic, it's been the best thing that's come out of this pandemic." Millie, whose child had lost their vision, expressed that they had been "on that journey" of learning what technology can be used to access content, "so hopefully it will just be moving forward with that, and if [they] need to listen to something voiceover [they] can do that in the classroom."

Barriers to access technology were identified when technology failed to work. This was evidenced when students lacked the skills to use the technology, it failed to work, or the cost of obtaining technology was prohibitive. Natalie explained for her child, learning technology was "another issue…not only can you not see and you've got to use all the technology." Natalie described that her child had struggled to apply technology knowledge in practice. Andrew, Simon, and Natalie shared circumstances where they had purchased technology to use at school and it was no longer operating. Natalie explained that there were compatibility issues between the braille device, the laptop and the JAWs screen reader, which she reported was frustrating for her child.

Andrew shared an explanation that perhaps assistive technology was not always considered necessary by the school and "had some issues that the teacher perhaps didn't understand or a principal that didn't understand what reasonable adjustments are.” He contended the family needed to advocate to have technology working within the school networks. Andrew shared a specific example:

> [My child’s] iPad was playing up about a year ago. Clearly, there were problems between the equipment and connections, which no doubt lead to frustration, which can probably lead to disengagement. And if you disengage, you get left behind, and then you’re in a downward spiral. In the end, [my wife] was able to advocate.

Millie related that the reason technology was not used in her situation, was because her child did not want to use it. She reported she had to “give Chris a lot of support” at home, particularly encouraging the use of technology “it’s really crucial that she becomes more comfortable and learns more skills with text to speech. It’s just vital because, without that, [they] won’t have the independence.” Understanding how to use technology for the students was further highlighted as important by Simon who noted that his child was working on “developing strategies for screen readers.”

One-third of parents (n = 2) acknowledged the cost of assistive technology to access the curriculum. Amanda explained the “cost of magnification machines and things like that is a lot more expensive” for people who have low vision. Natalie reflected that she did not have all the equipment her child required as “things have been tough as we don’t have the money to buy everything [my child] needs.” Another barrier for Natalie’s child was the difficulty managing technology at the same time as mobility throughout the school. She explained how her child used a cane and had additional equipment to carry, which then made it difficult to move independently through the school. Natalie explained that this often meant her child was unable to bring the equipment to the necessary classes, which was a barrier to accessing the curriculum.

Parents identified the technology had the potential to assist their child to access content within the school. However, the cost of technology, failure of equipment and lack of trials available, and the portability of equipment posed barriers to accessing learning.

7.2.3. Individual Characteristics of Students

Parents also identified individual characteristics of their children which they recognised were barriers and/or enablers to their child's education in a mainstream secondary school. Parents (n = 2) recognised confidence of their child as an enabler to learning. Louisa, who had two children with blindness and low vision related, "both are at the same school and have different experiences." She reported "both my [children] are very different in their own learning and their needs in particularly." When asked about her child, Jaime interviewed in Case Study A, she expressed that:

> Jaime is a fantastic learner, [they] just picked up everything really quickly. If [they] are faced with new technology, [they] just embrace it and know that it's useful and goes along and does it. And [they have] just got a fantastic memory.

She also explained that her child "stood up and did a presentation on themselves, and what they need" to the teachers at the beginning of the year. Louisa said that when the advisory teacher came to the school, she spent time working with her child assisting them "to be confident in asking questions and communicating [their needs] with the teachers."

Conversely, Millie shared that for her child, the school experience was "overwhelming." Her child lost her peripheral vision in late primary school, leaving them classified as having low vision. Millie expressed that her child had "a lot of reluctance with school, with feeling self-conscious." She elaborated, "I guess from my point of view … [they] really likes to minimize [their] needs. So [they] hide or adapts, and [they] don't want anyone to know [their] needs really, or what [their] requirements really are."

While Millie's child was able to minimise or hide her needs in the school environment for Amanda's child, who was completely blind, found there can be diversity in experience for students who are completely blind and those with low vision. She shared from her experience of watching her child and their friends that have low vision:

> I think there is quite a difference in terms of someone with visual impairment and then someone that is blind… It's hard to because sometimes a visually impaired student, depending on how much sight they've actually lost, can hide away and not want to be recognised if they have a visual impairment, which is understandable. And the other teachers might not necessarily know unless they've seen them walking with their cane that the child has got a visual impairment. And they might be, kind of forgotten about I supposed. Whereas with my child's situation. Well, [they] have to walk in with the cane regardless. You know that. It's definitely obvious that [they are] completely blind.

While there may have been differences between access due to the students' visual abilities, Andrew related that reduced vision impacted social relationships within the school environment:

> It stems around social and the lack of vision, and I think that has deeper impacts for the student; on how they are perceived, treated by their friends, forming friendships, a willingness to have them over. But also that as they grow older, others see how they need adjustments and how they are a little bit different and perhaps they're not picking up on things, the feedback from the peers and then they are not included.

Andrew explained blindness and low vision may impair social interactions which could be a barrier to success in secondary for students with blindness or low vision.

Individual characteristics such as confidence were identified by the parents of students with blindness and low vision. Parents also raised the impact of vision loss and interactions with others, as a barrier or enabler for the student with blindness or low vision. Along with the ability to access content and use technology to engage with learning.

7.2.4. Preparedness for Post-School Transition

Parents were asked "what sort of things do you think your child needs to be really employable when they finished school?" Knowledge and use of assistive technology were mentioned by all parents (n = 6) as important for the transition to further education or employment. Louisa added that in schools "students should be able to be given support, in the beginning, to become more independent in learning [assistive technology] skills and learning to be confident." Louisa also recognised the need for students to be able to "troubleshoot and manage" problems with technology. Millie reported that using assistive technology was important for her child to be able to access information independently post-school "it's really crucial that she becomes more comfortable and learns more skills with text to speech." Andrew related that it was important to teach students to be familiar with technology, as employers "don't want someone in the workforce who is needing special additional work. If they can work and fulfil the job in a similar manner with the technology to be self-sufficient." Parents expressed goals for their children to make decisions and use technology independently to use to access information to transition from mainstream schooling.

Skills for independence in living skills (n = 2) and orientation and mobility (n = 2) were also identified by other parents. Amanda thought being independent was the "number one" thing that would prepare students for transition. When asked to define what this could mean, she discussed skills to be organised, which was also identified by Millie as useful for transition. She would like her child to have the skills to “organise a calendar or a diary and organise her work into files.” Amanda also thought being independent included the skills of time management and orientation and mobility. She explained:

> [A] person has to be very time aware and have very good time management. It takes them half an hour longer to get to work because ... being completely blind it takes them a lot longer to get to somewhere.

Social skills were identified as important skills for future employment (n = 3). Amanda explained this meant “making sure [students with blindness and low vision] are aware that they need to look at people, even though they can’t see them and have good body language and all those things [sighted people] take for granted.” Andrew related that he would like to see his child “integrate with peers, because it’s really important that you don’t want to create a cohort of only blind people, as opposed to being integrated throughout the community, which is massively important for employment.” He relayed that “social interaction and networking” were skills that students would need to be able to be in the workforce. Simon explained that preparing for social inclusion in the workforce, was one of the reasons he sent his child to “mainstream school, as all of the participants in the school environment learn about each other.” Parents identified that social participation within the school was related to working with others in the workforce.

Access to career or guidance councillors within the school was identified by parents (n = 3) as something that could help students prepare for employment. Natalie shared that her child had not had an opportunity to consult with a career councillor in the school, which Natalie reported would have been useful. However, they had accessed services through outside blindness organisations, as had Andrew. For Amanda, she reported that the support from guidance councillor was useful. Amanda shared:

> [W]e had to set up guidance counsellor meetings and things like that to work out, which was the best avenue. And [my child] wanted to do four different

> options of what [they] could possibly be after [they] leave school. One of those options was becoming a lawyer. Well, yes, you normally do quite intricate academic subjects like chemistry and physics and all those things and they are quite visual again. So, like, do you choose those subjects or do you go more humanities base, which for a blind person tends to be a lot more accessible and also easier to do.

For Amanda, making decisions about her child’s subjects, involved thinking about accessibility needs within the subjects areas as well as future careers.

Parents identified assistive technology skills as important for the transition to further education or employment, along with characteristics such as being independent, which included organisational skills, time management, and orientation and mobility. Andrew advised that students needed to learn technology skills so they had “the ability to operate like everyone else…Ideally, they can do the job in a similar manner to everyone else once they have the technology to be self-sufficient.”

Parents also identified social interactions were important for working inclusively in the workplace. Career councillors were also seen as beneficial for helping make decisions around subject selection and employment options for students with blindness and low vision.

The next section outlines the perspectives of stakeholders with lived experience of blindness or low vision who have experienced mainstream secondary schooling, prior to finding employment.

7.3. Findings: People With Lived Experience Perspectives

This group of stakeholders considered as people with lived experiences all completed their schooling within the state in mainstream schools, having graduated over different time frames. Paul, who has been legally blind since birth, completed secondary 10 years prior to the interview. He has since worked in a variety of government administrative roles. Dianne was born completely blind, she has worked as a trained music teacher for the past 15 years. Emily also worked in secondary education for 20 years. Emily developed low vision in secondary school, due to an acquired eye condition. Yvel, legally blind from birth, worked as an academic in the tertiary sector (Figure 7.2). The interviews with four participants produced 93 references, which were categorised a) memories of inclusion within the school context (n = 22), b) memories of access to curriculum materials (n = 44), and c) memories of support systems (n = 27).

People with lived experiences	Paul, legally blind, 10 years employment Dianne, totally blind, 15 years employment Emily, acquired low vision, 20 years employment Yvel, low vision, low vision, 25 years employment

Figure 7.2 Anonymised Participants: People With Lived Experience

7.3.1. Memories of Inclusion Within the School and Workplace

Memories of inclusion were discussed by stakeholders with lived experiences of blindness and low vision. From his experience in secondary, Yvel posited it was important that students, with blindness or low vision, “feel as they are an equal in the classroom and not something less than being equal.” Paul expressed “that inclusion between people with blindness and less vision and sighted people, has become a lot better.” Despite completing secondary 10 years ago he based this on his experience from his secondary schooling where, “we were sort of taught we had to stick together in our own disability type and not and not go outside the realm and interact with the sighted members of the school.” Paul added that many students “created their own groups and it was very hard to crack through those, the outer shell, and get yourself in, be treated like everyone.” Dianne was also educated in a mainstream school “but socially, I certainly think a lot of things were inaccessible for me because I was just not welcome in my school by my peers.” Dianne shared that she thought

> It was so bad when I was going through, that I want to say that it's better. I want to think that we've got a better awareness of what happens when we take a group of different children and put them into a group of homogenously the same children.

Dianne explained that there is a "general difficulty" for students, with blindness and low vision, as they can not see incidental visual information and often require explicit teaching of compensatory skills, to "put these concepts together to sort of try to bridge the gap". This gap then results in a barrier to participating in mainstream school. Dianne was concerned about the "multimedia, digital, visually appealing stuff is really part of this new curriculum." She claimed this visual content was a barrier for students with blindness and low vision to be included in the school curriculum. She explained, "it's so visual and it's made to be eye grabbing. …but this doesn't mean anything to our kids."

While Dianne said it was important that teachers were "looking at the learner as an individual" she recognised that this could not always be achieved "when you've got 25 or 30 people in your class." She posited that for classroom content to be inclusive, all students should "have multiple ways of receiving information, different ways of getting the same information across because we're discovering so much more neurodiversity, and yet we're expecting everybody to digest one form of information all of the time." Dianne contended that providing information in multiple formats, provided curriculum access for all students in the classroom and minimised the need for adjustments for those with blindness and low vision.

Feelings about self were identified, by people with lived experience, as having an impact on their learning and inclusion in secondary (n = 2). Yvel commented, being a teenager had an impact on curriculum access for all students. Yvel reminisced, the "biggest issue for me was one of self-confidence. ... Students really need to feel confident that they can participate in work outside their disability and do that with confidence." However, he also reflected that he tried to find the balance between too little and too much confidence. He said as a consequence he "would have probably fallen into that category as an arrogant teenager, thinking… I know all there is to know about it. I don't need that." He said that resulted in him often failing to listen to or follow advice, "and there I probably went wrong." He said for this reason he found, for him, "it was such a big transition leaving high school."

Self-belief was also identified as important for success by Dianne, who had "a very difficult time of it" whilst in secondary. She related "it would have been much, much worse if I didn't have my particular types of ability, if you know what I mean. Like if I didn't have a good IQ." She revealed her intelligence helped her to "put these concepts together". She reflected that it would be better, if opportunities were provided for all students in mainstream schools, to have "multiple ways of receiving information. … It would just be nice to see that be a little bit broader so that the kids can find out what works for them."

For Emily, who lost her vision at the end of Year 10, she reported school "was just a nightmare." She recounted "you can't do things like your peers… you can't run around, play soccer anymore." She remembered having a sense of "missing out on things you might have wanted to do, and there are barriers to that." Emily also identified a fear of the unknown impacted her sense of self. She said she spent a lot of her secondary wondering how she:

> …was going to fit into the big wide outside world, in terms of my diminishing vision, which was not explicit in any way, shape, or form. Nobody, even if they knew what was expected, they certainly didn't tell me. So there was just that underlying thing of what could be. How was I to fit in there?

Emily added that losing her vision, as a teenager, was "very difficult to manage." She explained, "it's really hard during adolescence when you're trying to figure out what your identity is anyway to deal with the extra things that come as part of doing school with blindness or low vision."

Appearing different than their peers was raised by people with lived experience as a barrier to social inclusion within the school environment (n = 2). Yvel said that throughout secondary, he had “to do a lot of self-work to get myself over that period of feeling uncomfortable about doing things differently.” Emily also identified feeling different, sharing an example of a “group project where [they were] supposed to grow some wheat, then assess it in the classroom.” However, this meant she needed to rely on others “you have to depend on someone telling you things. You can’t see yourself and you can’t do things like your peers.” For her, enablers to success were being “able to believe in yourself, and believe you can do it and you’ve got supports to get there. I think was the key thing overall.”

All participants (n = 4) identified the skills to interact with others as an enabler to inclusion in school, and also for future employment. For Dianne, “the social side” was the most difficult part of her education. Similarly, Paul revealed it was hard to “be functional, and trying to remember all the social things that you sort of have to do with kids.” After being an employee, he realised the skills of social interaction converted into the workplace, specifically “being able to interact in a team environment with the skills to be able to effectively communicate.” From Yvel’s perspective not being able to see as well resulted in him not always being able to contribute socially within the classroom. He reported an enabler was ensuring the student with blindness and low vision “doesn’t get isolated in the classroom situation, particularly when people are contributing either to the whole group or just in small subgroups. It’s really important to make sure that they are able to contribute to their full potential.”

Explicit teaching of social skills was identified by people with lived experience (n = 3) as advantageous for students with blindness and low vision in regards to future employment. Dianne posited students, with blindness and low vision, required the “opportunity to learn all the skills that will not necessarily come naturally to them.” For Yvel, this included, “important issues in that educational thing is to make sure that the visually impaired person student learns teamwork skills.” Similarly, Paul contended, “working in a team skill building" should be explicit in secondary, as these would have helped him in his current employment.

Participation in extra-curricular activities was viewed as advantageous for future employment by people with lived experience (n = 2). Yvel participated in "an awful lot of things in high school, which I would have thought would reinforce confidence…I was active in athletics. I was active in intellectual things such as a debating team, all sorts of competitive things." Conversely, Paul experienced barriers to participation within school due to the location of his school and transportation: "I think one of the challenges for me particularly was for me was to be included in the extra-curricula school activities." When asked to clarify, he explained, "I know this has changed, but when I went to school, you couldn't go to your local school," and instead attended a school that had a support unit for students with blindness and low vision. This meant he "went to a school that was more than 45 minutes away" from where he lived, by a government-funded taxi. Paul expressed that he enjoyed being involved in drama and musicals which rehearsed outside of school hours, but the distance from his school, and therefore transportation services, limited his participation in these activities. He related: "it was a significant challenge the way that taxi services and other sorts of transport services were particularly organised."

People with lived experience related memories of barriers to inclusion, such as lack of confidence and participation, along with individual characteristics which may have inhibited inclusion during secondary. This group of stakeholders also provided recounts of modifications made to help access the curriculum.

7.3.2. Memories of Access to Curriculum Materials

In the absence of materials being provided in an accessible format, modifications to ensure access to curriculum content were considered an enabler to curriculum access by people with lived experience (n = 3). Paul reported that receiving "accessible documentation was quite a challenge, in that a lot of the issues stem from not having accessible image descriptions on images and document [s].” Similarly, Dianne declared “that the main issue has been and always will be the accessibility of resources in terms of learning.” Dianne experienced when she was at school, it “was as simple as did you have the material or didn’t you”. Whereas for students currently in mainstream schools, from what she was aware of, “the material is becoming so dynamic that students are having trouble accessing it.” She related that when she went to school, barriers in getting modifications arose because “the teacher hadn’t bothered to get the material down to the vision-impaired unit so that it could be split between three or four teachers or teacher aides with Perkins braillers and they could madly get it brailled out.” However, she discussed that in current classrooms there are:

> A lot of problems with graphically represented ideas … I know full textbooks that are page after page of scanned images, rather than a properly published text. I also am discovering that because things are moving to online, they’re making more use of platforms like Flash and platforms that, our screen readers can not cope with. … All this sort of fancy bells and whistles stuff that the kids these days are using is actually, I think, really quite inaccessible for our kids.

From her experience as a person with blindness and low vision and also a trained music teacher, Dianne expressed concern with some curriculum materials which may create barriers to accessing learning. She described that with the current multimedia curriculum “some of the things you just can’t braille.” She explained some people have used three-dimensional graphics to try to represent images, however, she explained “even if you get the most fantastic [three-dimensional] graphics in the world, it’s going to lose something in the translation. … and you’re also adding a subjective lens to it that someone’s made a decision about how it’s going to be represented.”

Simple modifications were useful for Yvel. He disclosed that when he was in secondary he had a “visual condition as opposed to blindness in general. At that point, I had what I would consider a fair bit of vision, even though I was blind, legally blind, and couldn't read normal print textbooks in the light." He said for such a student with low vision, "They might just need to sit in a place where they can see whatever it is it needs to be seen. Or if it's something they have to read and they can't read it, somebody to read it."

Participants (n = 2) shared that certain subjects required increased modifications due to visual content, resulting in participation in all subjects being noted as either a potential barrier/enabler to their success in secondary. Emily shared that she was a very academic student, who wanted to be a neurosurgeon or a pilot. She disclosed that after she lost most of her vision, she was denied access to some subjects: "I wanted to do all of these academic subjects and my vision stopped all that. I wasn't allowed to do maths, but it was my love." Yvel, who became a professor in mathematics, said "it just it brings me to tears when I hear stories of groups of people, whether they're visually impaired or whatever other demographic they belong to." Yvel said "computing and mathematics should be it should be the most accessible thing in the world for a person with a visual disability." Emily added that subject accessibility was not limited to maths and recalled "people saying in a very kindly manner across the desk 'had you thought of perhaps instead of doing art that you might well do history?'" Emily recognised that it was a barrier to success when students were given either, "implicit or explicit messages about not doing … I'm just trying to say it is the way it is put across by powerful, perhaps liked or feared person in the school."

Dianne said that by senior secondary, students should be beginning to make their own modifications, without relying on their teachers. Dianne declared that she "was going to be controversial" but when talking about modifications to access curriculum content, she imparted that blindness and low vision are "a low incidence disability and [educators] just don't know about us." She perceived it was a barrier to curriculum access when students expect a "notion of just hand it to me and make it easy, so I can do it." According to Dianne, she contended "it is a two-way street," explaining that in university she had to braille all the music herself. "I just went, I haven't done this before … but I'll give it a go, and I brailled it. Some of my really early scores are almost unintelligible, but I got better, and better, at it." Dianne maintained that when she heard from students, with blindness or low vision, that there were problems, she always asked “what steps are individuals taking and what have they done to contribute?” She elaborated:

> People stand there and say, I couldn’t do my course. It wasn’t accessible. Okay, what bits? What did you do about it? Who did you tell? What kind of consultations did you go into? And the answers are usually, nothing. It wasn’t accessible, so I gave up.

Dianne expressed that independent access to curriculum content was an enabler to learning. Similarly, Paul shared that technology provided the opportunity for a person to make modifications independently. However, he also found some elements difficult and frustrating, such as using touchscreens and mark up in word documents, which he was unable to access using his assistive technology. Paul experienced it was sometimes challenging to maintain up to date with assistive technology. He also reported that he had more to do than most to access the curriculum. He explained, “we have to rely so much on technology and braille devices and trying to remember so much in how to operate a particular device or a particular piece of technology.” Yvel enumerated that technology could be an enabler if students with blindness and low vision were “confident that they can work in an environment where nobody else has this equipment. They have to achieve their goals and they shouldn’t have any negative thoughts about it.”

People with lived experience shared memories of how modifications were made to access curriculum materials, through alternate formats, support from teachers, and technology. The stakeholders identified barriers such as keeping up to date with technology, along with the confidence to use technology independently.

7.3.3. Memories of Support Systems

People with lived experience reminisced about teachers who had supported them during their secondary years. It was identified to be a barrier if teachers did not have the same expectations for students with blindness and low vision, as for their sighted peers. Paul recalled that he went to the guidance officer in secondary to discuss career choices. He found “it was a significant challenge to get anyone to even have some way of acknowledging that I had skills that were employable. Nobody sort of saw that.” Similarly, mused that it was difficult when people disclosed lowered expectations of her because she had lost her vision. She related an example:

> I was told all I could do was become a telephonist at the Telstra exchange down the road. … I was enraged. I knew I was smart. I knew I could have been a neurosurgeon. And yet this is what they thought I should do. So I think a barrier is, the limited, very powerful limitations put on kids. … because with adjustments, I could be anything. I mean, so probably not a pilot. But you know.

Emily expressed teacher expectations, for her future, failed to take into account her abilities. Emily communicated that modifications enable a person with blindness and low vision to have the same expectations, however, conceded that there may have been certain jobs that were not possible with low vision. Conversely, high expectations and support from teachers were viewed as an enabler to success in Paul’s educational experience. He stated, “what works well is a lot of really consistent help provided.”

External agencies, such as advisory teachers and therapists, were potential barriers or enablers for this group of participants. Emily expressed that external agencies played a large part in educating the teachers but “were slow to respond, in my experience, to the needs of students in higher education.” Paul related, for him, that support “got more complicated as more people were involved. There was a lot of challenges around trying to find the right person or for the right person to go through in particular circumstances.” Geographic location impacted the support provided to Dianne, who enumerated that “[external agencies] are woeful in supporting the regions.”

Participants with lived experience identified support from their parents and families, as impacting their employability (n = 2). Dianne shared “early life circumstances and parenting and certain teachers” were enablers for her independence. She communicated her parents were a part of her success as they made her complete chores independently, which she contended set her up for employment: “that’s what you do with every kid. You give them jobs and you make the job suitable for the age range.” She added, for children with blindness and low vision, “you may have to take into account things, but you just work it out.” She was shocked to find out later in life that “what most parents do—is just not give the blind kid a job.” She posited this resulted in a barrier to their independence and employability: “some people who are my age, they really can’t get employment. And it just breaks my heart.”

Emily recalled that losing her vision was difficult for her family. She reasoned “I think that it’s a whole complex thing for the parents.” From her perspective, Emily found a “the whole community, the parents, the kids, and the school … have to work harder on things to get everyone on board or supporting, or fully understanding.” Parental support was considered important for Emily, as she regarded vision loss “changed your outcome or what you wanted to do and wanted to be” and for her, family support was important in helping overcome the emotional impact of vision loss.

People with lived experience shared memories of their experience in mainstream schools and employment, along with attitudes and expectations of their teachers and interactions with peers. They recalled how they accessed curriculum through modifications and technology and discussed support available for them, specifically perceptions of themselves, expectations from teachers, and family support.

The following section reveals the findings from the employment consultant/employers, responsible for hiring employees within their company or finding employment for people with blindness and low vision.

7.4. Findings: Employment Consultant/Employers Perspectives

An employment consultant, Susie, who worked specifically to place people with blindness or low vision into employment was interviewed, along with three human relations consultants, Olivia, Thomas, and Ta, who were responsible for hiring new employees in large firms within banking/insurance, information communications technology (ICT) and engineering sectors (as outlined in Figure 7.3). The employment consultant/employers were interviewed via Zoom and asked a) what they would like to know about people with blindness and low employment and b) what do they think are barriers and enablers to the workforce for people with blindness and low vision. The responses are discussed in the following sections.

Employee consultants	Susie
Employers	Olivia (Human Relations, banking/insurance) Thomas (Human Relations, ICT) Ta (Human Relations, engineering)

Figure 7.3 Anonymised Participants: Employment Consultant/Employers

7.4.1. What Employers Want to Know About People With Blindness or Low Vision

Employers shared what they would like to know about people, with blindness and low vision, which included a) knowledge and skills to do the specific job, b) social interaction skills, and c) job access through modifications, technology and orientation and mobility.

7.4.1.1. Knowledge and Skills to do the Job

When asked "What do you want to know about people with blindness and low vision when you are employing them?" all three employers reported the most important thing was that they had the skills required to do the job. Ta detailed this was inclusive of “primary job competencies for the job, over and above they are vision impaired or blind.” She explained that she would want to know if the applicant has “professional experience or educational experience for the job they applied.” Thomas, expressed his thinking was about the job that was needed to be done first and the disability second, “assuming they can do the work and do the job, what else do they need?” Similarly, Olivia shared, that when she was recruiting, she would “focus on the task rather than how they would do it.”

Participants advised, that due to legal requirements, disclosing a disability to an employer is no longer part of the hiring process. Ta explained employers “do have general questions. For example, are there any circumstances that hinder your ability to do the role? If you ticked yes, the interviewer would ask more questions.” Olivia explained, “We are very careful with application forms that ensure we are not discriminatory.” She enumerated:

> I would imagine that a potential employee’s disability would be disclosed at an interview. But with all interviews currently remote on zoom or phone, we have roles such as work at-home roles. Someone who is blind could be employed at home and we may not even know.

Employers shared that they were interested in knowing if people had the skills to do the job they were applying for, and due to current hiring processes, may not be aware that someone had a disability.

7.4.1.2. Social Interaction Skills

Social interaction within the workforce was further highlighted as a consideration for the employment consultant/employers (n = 4). Employers were interested in “socialisation in and around the office” (Olivia), for the person who is blind or has low vision. Olivia shared that “knowing what they can see may help others in the team” which she expressed was important for everyone to be able to “engage and interact.” She was also interested in understanding how the individual, with blindness or low vision, could "work in close proximity with others." Ta agreed reflecting it was important to find out "how people should interact" and if there were any "tips and tricks to ensure they feel comfortable." Thomas imparted for him, "being able to translate technology into layman's terms. What is important for me in training people is how it applies and not as technical." He shared "relationships are important bridging no technical to technical." Susie reported that she is often called into the workplace to assist a person "who is in danger of dropping out of their work." She mentioned that "sometimes it is because the vision impairment, but at other times it's because of their social skills and it's because they are having difficulty interacting and communicating with people in an appropriate way in the workplace". Knowing how people with blindness and low vision would interact with others in the workforce was an important question for employers.

7.4.1.3. How People Access the Job

All employers (n = 3) wanted to know how people with blindness and low vision would access work materials, such as printed and digital information. Thomas shared that he would want to know what people with blindness and low vision "need which is different to make them successful?" He explained that he would usually find this out before the person started employment: "during an interview for the role, I would be looking to find out in order to do the role, what is the gap, what capability or tool do you need to ensure success. I would be doing this for any candidate."

Ta similarly asserted it was important to know what modifications and assistive technologies the person would need to do the job. She expressed she would "want to know upfront what adaptions our company could make… the cost and technology access required." She said if people could advise how they made adjustments to access, and "if they have the competency to use assistive technologies, on top of workplace requirements, that will give me confidence in their ability to make adaptions." Thomas agreed that if people, with blindness and low vision, "came with skills in place and have access sorted—that is desirable." Susie discussed that it was important for employees to have technology skills, such as “navigating around a report or a website” as well as being confident to have a meeting using Zoom. Similarly, Olivia related, in her workplace all employees “need to have skills to access computers and Systems.” She also noted that an enabler would be if the potential employee is “prepared and know how to adapt and can possibly coach the company how to adapt. Instead of saying I’m here and what will you do to support me?”

Additionally, all employers (n = 3) wondered how future employees would independently orientate and move around the workplace. Ta shared that she wondered how they would know the “Layout of the workplace—who is in each pod and where they sit?” Similarly, Olivia was “interested in things such as how are they able to work in the office environment, access the workplace and how they commute to and from work.” Thomas noted that a person, with blindness or low vision, may be well suited to work from home positions: “I can see working from home is an advantage, having to work in an environment with their own set up would be very useful.” The employment consultant also noted that orientation and mobility are especially important to be independent in the workspace and employees can access “supports that are specific to their needs” when they begin a new job.

The employers shared it was significant for them to know if people had the knowledge and skills to perform the job advertised. Employers were interested to know how people, with blindness, or low vision, would orientate themselves and move around the workplace, interact with other employees and make modifications to access work materials.

7.4.2. Enablers to the Workforce

This section outlines the employment consultant/employer’s perspective of enablers to the workforce for people with blindness or low vision, which included a) use of mainstream technology, b) preparation for the workforce, c) opportunities for participation.

7.4.2.1. Use of Mainstream Technology

Technology was considered by the employment consultant/employers an enabler to success for employment (n = 2). Thomas worked in the ICT field, he expressed all employees needed to "come with capability and knowledge into the workplace and use technology. There is an expectation that they could use technology to do the job." Susie also concurred "good knowledge of technical skills" is important in the workplace, and voiced concern that students, with blindness or low vision, do not possess the basic requisite skills for employment. She shared "a lot of the times when people leave secondary education come to us, they're actually quite low skilled compared to their sighted counterparts." Susie elaborated:

> Even though people in a mainstream classroom are supposed to be included and held to the same standards as their sighted peers, that doesn't seem to be happening. I don't know if that's because the teachers don't have a good knowledge of technical skills or teachers feel like they should give them a pass because they don't believe that they will go into employment or into further education.

The employment consultant recognised the importance of technology as an enabler in employment, however shared that teacher expectations, or teachers' knowledge of technology may be posing a barrier to students graduating with necessary technology skills for the workforce.

Knowledge of braille was also noted as an enabler to success for people with blindness and low vision in employment. Susie shared that people with blindness and low vision without "braille literacy, people are at a huge disadvantage." She shared

> What we've found is that some people who have graduated from secondary school are actually illiterate so they can use voice over on their phone and

> they can send things through voice to text, but they can't actually type out words or spell… and that means that when people have to write up reports that they're relying on text to speech, but they don't actually know how to write, or how to spell things, or proper grammar or punctuation and that's a huge problem.

Susie shared that literacy skills afforded through braille were identified as enablers to the workforce.

7.4.2.2. Preparation for the Workforce

Preparation for the workforce, specifically learning about work, was considered an important enabler for the workforce according to the employment consultant/employers (n = 3). When asked "what skills do you think we should be preparing young people with, in secondary, to prepare them for employment?" Susie replied, "The most important one, I think, is absolutely learning about work… they should be exposed to different types of careers." Ta explained that when she was in Year 9 she did a career unit at school, which she reported set her up for her future employment. She recalled the subject included lessons on "how to write a resume, how to interview, how to find a job, and how to work out what you need as a requirement for each industry." She reported these skills were relevant now for students and could be completed whilst at school. Olivia added it "would be really important to have work placements, to be able to say, I worked in [an] office." She considered this was not only important for the experience, however also to have a reference or referee when applying for a job in the future.

Opportunities to participate in activities that prepare for work were recognised as important enablers to preparing people for the workforce. Having considerable experience in job placement of students in this group, for part-time jobs and graduate employment, Susie said that "what works well in education has to do with parental expectations when the parents … hold them to high standards and push for participation more inclusively." She added that within successful education, participation usually emanated from "parental support and teacher support. There's always like one or two teachers that have made sure that they get into everything that they want to." Susie added that included expectations that students would participate and "should have full access to things like extracurricular activities, sports, and other clubs." She commented that there are only a very few students with blindness and low vision who "have extracurricular activities that are not related to their vision impairment." She shared that although students usually participate in activities such as goalball and blind cricket whilst at school, "they won't have debate class and they won't have the choir." She asserted it was important to participate in as many extra-curricular activities with peers as possible because "I think that's the idea of inclusivity that needs to be started young so that when they're older, they feel they can do things within the community as much as their sighted peers."

Susie articulated that a component of participation was the expectations that students, with blindness and low vision, would be involved in "household chores, part-time jobs, work experience, and volunteering." She said in her experience some people will say "well, you don't need to do it because you're vision impaired." However, she posited that was a barrier to future success as they:

> …don't actually get any hands-on work experience or they get put into an environment like [Blindness organisation], where it's specific to blindness because it's assumed that that's the only place that they can work. I find that very heartbreaking that people don't get exposed to real-life work environments, proper etiquette and what's acceptable.

Susie did note that in "regional rural areas, the supports may not be available at all" which could result in people, with blindness and low vision, not being able to "experience a wide range of jobs, not just the ones that are considered appropriate for vision impairment." Susie proposed geographic location could therefore pose a barrier to participation in employment for students with blindness and low vision.

The disability employment consultant/employers identified things they would like to know about a person with blindness and low vision before employing them, such as the skills they have necessary for the job, their capacity to make and advocate for modifications, move around the workplace and interact with their peers. Enablers to success, such as prior preparation of the workforce, technology skills, and participation in extra-curricula activities, and work experience, high expectations, and braille literacy were also noted by the participants in the interviews. The employment consultant/employers supported that a significant enabler was that the person with blindness or low vision possessed the knowledge and skills to do the job advertised.

7.5. Summary

This chapter outlined the perceptions of additional stakeholders considered within the ecosystem of secondary students with blindness and low vision in mainstream schools. This included parents of students with blindness and low vision, people with lived experience of blindness and low vision, along with the employment consultant/employers.

All stakeholders identified enablers such as independent use of modifications and technology to access the school curriculum (parents and lived experience) and workplace requirements (employers and lived experience). Parents and people with lived experience also recognised teacher support and expectations were important for students with blindness and low vision and their success in secondary schooling. Employers also listed preparation for employment as an enabler, specifically learning about work. Both people with lived experience and the employment consultant/employers said that doing chores, and participating in extra curricula activities was important, as preparation for work and social interaction.

According to the stakeholders, barriers arose when students with blindness and low vision where students did not have the knowledge or confidence to use technology that would afford access to the school or workplace. People with lived experience shared that perceptions of self and confidence could impact success in secondary and into the workplace. Similarly, the employment consultant/employers imparted independence was important, particularly in terms of getting around the workspace and making modifications to work materials.

The previous Chapters, 5, 6, and 7, outlined the data findings for the participants within the ecosystems of students with blindness and low vision, in secondary, in mainstream schools. These findings will now be discussed collectively in Chapter 8, as per Stake's (2005) *Multiple Case Study Analysis* approach.

Chapter 8. Discussion

8.1. Introduction

The data findings from interviews with seven stakeholder groups were presented separately in the previous chapters. Chapter 5 outlined qualitative findings from interviews with students with blindness and low vision. Chapter 6 presented data through the perspectives of educational stakeholders: a) teaching staff, b) advisory teachers/therapists, and c) policy-makers. Chapter 7 shared findings from interviews with a) parents/carers, b) people with lived experience, and c) employment consultant/employers. In line with Stake's (2005) *Multiple Case Study Analysis*, Chapter 8 will collectively discuss the findings of the seven case study groups identified within the ecosystem of the students with blindness and low vision to address Research Question 1: What do a range of stakeholders perceive enables and/or inhibits access for secondary students with blindness and low vision, in relation to learning and future employability? The discussion will be presented by identifying the proximal processes which impact learning and future employability for students with blindness and low vision, followed by barriers and enablers that occur within the ecosystem (person, context and time) to impact the proximal processes.

This will additionally address Research Question 2: How do the findings from these perspectives relate to Bronfenbrenner's Bioecological Systems Model in identifying barriers for students with blindness and low vision? The overall research aim of this study was to examine why despite the changes in legislation, employers' attitudes towards disability, and technology, only 24% of people with blindness and low vision are in full-time employment. By purposefully selecting and listening to the voices of stakeholders from throughout the ecosystem, this study was able to gain an holistic understanding of the barriers and enablers that impacted on participation in learning and future employability for a person with blindness and low vision in mainstream secondary schools.

8.2. Developmental Outcomes Under Consideration

Interview questions were focused to elicit understanding of the barriers and/or enablers that impacted students with blindness and low vision the developmental outcomes:

a) participation in learning, and
b) future employability

The importance of these developmental outcomes will be described through the collective voices of the participants (N = 36) and discussed in relation to current literature.

8.2.1. Participation in Learning

The first developmental outcome of participation in learning is based on the Australian education goal “the Australian education system promotes equity and excellence” (Education Council, 2019, p. 6). Being blind or having low vision was identified as impacting participation in learning by all stakeholders within this study, excluding the disability consultant/employer. This is illustrated by 35% of references in the empirical data which identified the impact of their sensory disability on learning (n = 340, N = 968). Participants shared that the visual way the Australian Curriculum content was presented and delivered in secondary schools, meant the academic content of the curriculum was not always accessible for students with blindness and low vision. Students in this study reported inaccessible academic curriculum materials that were provided in the classroom, including:

- printed documents (Chris)
- information on the board (Jaime)
- textbooks, diagrams, images, graphs, and tables (Kye)
- learning management systems (Jo, Sam)

Multimedia and visual images, as a mechanism of modern culture and social practice (Araújo et al., 2021), have been increasingly used in Australian classrooms to motivate students to interact with the content of the curriculum (Faccin-Herman, 2020; Zhu et al., 2020). However, despite the education goal to promote equity for all Australian students (Education Council, 2019), not all students could interact with the content. Thus, the standardised curriculum and assessment resulted in additional equity issues for many diverse groups of students within Australian schools (Anderson & Boyle, 2015). The results from this study showed teachers were modifying learning and teaching materials in the curriculum. However accessibility requirements for students with blindness and low vision were not embedded into the curriculum which impacted students' participation in learning.

Reduced opportunities to participate in learning were reported by various stakeholders (n = 7) in external examinations and extra-curricular activities, which had the potential to negatively impact students' employment outcomes. Participants shared examples where students were withdrawn from external examinations or extra-curricular activities as modifications were not available. Removing students from testing was problematic because participation and completion of secondary for all students were important goals of both the Australian Curriculum (ACARA, 2012; Education Council, 2019). Practices that discouraged participation contravened the legal requirement of the *Salamanca Statemen*t (UNESCO, 1994), which stated that "schools should accommodate all students regardless of their physical, intellectual, emotional, linguistic or other conditions" (p. 6). Figures from the Australian Institute of Health and Welfare (AIHW, 2020) showed 34% of people with disabilities completed Year 12 or equivalent each year, compared to 66% of people without disabilities. The lower levels of completion for students with disabilities have been attributed, in part, to difficulties accessing curriculum content (Commonwealth of Australia, 2016). These findings were concerning in terms of continuing education and career options. If students could not access examinations equitably, they may not have been able to accurately depict their knowledge, which may have impacted subject grade results and tertiary entrance scores.

Various stakeholders (n = 7) shared barriers for students participating in subjects, such as mathematics and physical education, due to inaccessible curriculum materials or activities. Other examples of subject inaccessibility were provided by teachers, advisory teachers/therapists, parents, policy-makers, and people with lived experience. A parent further reported that accessibility in certain subjects influenced career decisions when they considered subject selection for Years 11 and 12. Discouraging or excluding students from choosing subjects due to accessibility did not afford all students the education goal of equity in education (Education Council, 2019).

Excluding mathematics as a subject could limit career choices for students, especially in the field of Science, Technology, Engineering, and Mathematics (STEM), which was comprised of one-fifth of Australia's workforce and made significant contributions to society (Australian Government Office of the Chief Scientist, 2016). This study identified participants who were limited in their choice of career due to subject selection. Emily, a person with lived experience, recalled that being denied access to mathematics as a subject selection in secondary impacted her career options. However, participants also shared positive situations, which demonstrated that students with blindness and low vision were able to succeed in mathematics when collaborative support and expert knowledge were provided.

All students (n = 6) reported they were able to access some materials independently through the use of assistive technology and other compensatory skills. The students' use of disability-specific skills to access learning was pleasing, as it aligned to a growing body of literature that highlighted the importance of students becoming independent in their learning in secondary school to prepare for further education and employment (Keil & Cobb, 2019; McLinden et al., 2016). The phrases, *access to learning* and *learning to access*, have been used to describe students' increasing agency in their learning as they get older (Keil & Cobb, 2019; McLinden et al., 2016). Access to learning is based on the belief that when students were younger, they were provided with materials in their preferred format. Learning to access resulted from increased independence as students made goals and decisions about how they could participate in learning (Keil & Cobb, 2019; McLinden et al., 2016). As students became older, it was supported that they needed to develop disability-specific skills to access information independently, advocate for their learning needs and goals and have skills to navigate the environment, which would benefit their participation in future learning or employment (Hewett et al., 2018; Keil & Cobb, 2019; McLinden et al., 2016; Sapp & Hatlen, 2010).

Stakeholders within this study (n = 21) discussed the implementation of many disability-specific skills as an enabler to participate in learning, including compensatory skills, assistive technology, braille, self-determination, social skills and orientation and mobility. In Australia, these disability-specific skills are also known as the Expanded Core Curriculum (ECC). SPEVI (2016) recommended that these nine skills be explicitly taught to students with blindness and low vision in schools to develop compensatory methods to access information that people with vision gain incidentally through sight. While this study found that all 16 education participants viewed explicit teaching of disability-specific skills as enablers in learning, time to implement disability-specific skills alongside an academic curriculum was raised as a concern by all education stakeholder groups. These findings are important, as they indicate that despite disability-specific skills being essential to enable access to learning, barriers, such as time, impacted the implementation of these skills within the mainstream secondary school.

8.2.2. Future Employability

The second developmental outcome, future employability, is based on the interconnected educational goal of ensuring “all young Australians become confident and creative individuals, successful lifelong learners, and active and informed members of the community” (Education Council, 2019, p. 4). The stakeholders in this study were asked what factors were essential for the future employability of students with blindness and low vision. References from stakeholder responses (21%, n = 207) evidenced the following themes: knowledge to do the job, personal characteristics, social and communication skills, and disability-specific skills (as outlined in Table 8.1).

Table 8.1 **Stakeholders' Perceptions of Factors That Influence Future Employability (as per individual participants in this study)**

Stakeholder	Knowledge to do the job (cognitive skills)	Personal characteristics (intrapersonal)	Social skills (interpersonal)	Disability-specific skills
Students	• general technology programs and skills	• presentable • efficient • happy and willing to serve	• communication • teamwork • dealing with bullies	• support to creating resumes and cover letters • assistive technology • orientation and mobility (O & M)
Teaching staff	• curriculum content	• organisation		• assistive technology
Advisory teachers/ therapists		• confidence • independence • make decisions		• workplace structure • knowledge of types of jobs • knowledge of job requirements • opportunities for participation • assistive technology • braille • compensatory skills
Policy-Makers	• access to work materials	• independence • make decisions	• group activities	• career counselling • participation in jobs • chores • braille • O & M • assistive technology
Parents		• troubleshoot • make decisions • independent • time management	• social interactions	• support to choose subjects • guidance officer • assistive technology • O & M
People with lived experience		• independent • beliefs of others	• social skills • access to extra curriculum activities • support systems	• opportunities for participation • compensatory skills • braille • assistive technology
Employment consultant/ employers	• knowledge to do the job • access to work materials	• high expectations (previously modelled by others)	• social interactions	• opportunities for participation • access—ability to make modifications independently • assistive technology • O & M • braille

An important finding was that three of the four themes aligned with a recent systematic literature review of career readiness measures in high school (Warner et al., 2019). This study was part of a national project in the United States, which collated and analysed the important elements required for future employability. A standardised career readiness framework was then developed to measure the essential elements required for future employability (Warner et al., 2020). These skills were identified as:

- cognitive components of employment, such as literacy, numeracy, and technology skills, along with critical thinking
- intrapersonal skills, such as work ethic, attitude, and self-regulation, and
- interpersonal skills, such as communication and the ability to work in a team.

The following section will discuss skills for future employability for all students, followed by the unique skills required by students with blindness and low vision.

8.2.2.1. Employability Skills for all Students

Employers reported that there were laws that prevented employers from requesting information about disability in the recruitment process. One employer mentioned they had interview questions to elicit if people needed additional modifications in the workforce, which were worded carefully so as not to discriminate in the hiring process. These findings confirmed previous literature that people with blindness and low vision would have the same expectations of work in a competitive job market (Allman & Lewis, 2014; Blackshear, 2014; Brown et al., 2013; Hatlen, 1996; Levin & Rotheram-Fuller, 2011; Lohmeier et al., 2009; Siu & Morash, 2014; Wolffe & Kelly, 2011). An interesting finding reported highlighted that during the Covid 19 pandemic, many potential employees were interviewed through teleconferencing. An employer reflected they might have employed people with blindness or low vision without being aware.

All the employers (n = 3) reported the knowledge and skills required for the advertised role as the priority when employing a person into a position. Other stakeholders groups also identified cognitive knowledge, such as understanding general technology programs, like Word and PowerPoint (students), and knowledge of the Australian Curriculum content (teachers) as necessary for preparation for future employment. The design of the Australian Curriculum intended literacy, numeracy, technology, and critical thinking skills to be integrated throughout the academic content to allow students to develop the cognitive knowledge required in the workplace (ACARA, 2009). This finding was crucial, as it identified that if students with blindness and low vision could develop the knowledge and skills to participate in learning, they were also being prepared for future employability.

Personal and social characteristics were identified by participants in this study as skills required in future employment. Stakeholders listed personal characteristics which they felt were necessary for career readiness such as:

- independence
- confidence
- the ability to make decisions, and
- personal agency.

Additionally, students provided practical characteristics they felt they would require for future employment such as being presentable, efficient, and willing to serve others. Social interactions, working within a team, and communication skills were identified by stakeholders (n = 9) as interpersonal skills impacting career readiness. A stakeholder used the term *soft skills* to refer to the interpersonal and intrapersonal skills deemed necessary in employment. Soft skills are behaviours, attitudes, and traits that a person possesses and involve communication, work ethic, teamwork, and critical thinking (Teng et al., 2019). When considering youth in graduate entry positions, studies found soft skills were desirable by employers as the skills were transferable to different roles (Singh & Jaykumar, 2019; Tulgan, 2015). This finding would indicate that if students with blindness and low vision have interpersonal and intrapersonal skills, they may have increased opportunities for employment.

The Australian Curriculum also recognised the importance of soft skills in the general curriculum's personal and social capabilities strand. Personal and social capabilities included knowledge and skills to communicate effectively, work collaboratively, make decisions, manage conflict and develop leadership skills, integrated into learning areas throughout students' schooling (ACARA, 2021). General capabilities embedded in the Australian Curriculum further highlighted how mainstream schooling intends to prepare students for future employability.

This study found that students with blindness and low vision were not always able to access implicit skills of the cognitive curriculum within the classroom due to not being able to view incidental information. Participants reported lack of visual information resulted in "gaps in learning" (Heather, Sarah) and decreased opportunities for social feedback from peers. These findings aligned closely with evidence from this literature which suggested that students with blindness and low vision may have limited social skills resulting from decreased visual input. Students with blindness and low vision may not be able to see body language, know when someone is talking or when to interject, or model from other people's social cues (Allman & Lewis, 2014). Further studies found that students with blindness and low vision may need explicit teaching to access the personal and social capabilities embedded in the curriculum and prepare for future employability.

8.2.2.2. Employability Skills Specific to Students With Blindness and Low Vision

Participants identified employability skills specific to blindness and low vision as compensatory access, assistive technology, sensory efficiency, self-determination, social interaction skills, orientation and mobility, and learning about work (see Table 8.1). Further the employers within this study (n = 3) wanted to know that people with blindness and low vision could make modifications and use technology skills to do their job efficiently.

The use of compensatory skills to independently access the required information in the workplace was identified by participants as an enabler to future employability (n = 12). These findings aligned with *Employment Research Report* (Vision Australia, 2021b), which shared data from interviews with over 1000 Australian employers. The report revealed that 79% of businesses would be willing to employ "if they knew that with the right technology, a person who is blind or has low vision can be as productive as their fully sighted peers" (Vision Australia, 2021b, p. 18).

Knowledge and use of assistive technology (along with general technology) was identified as an important tool for independently accessing future work materials by all students within this study (n = 6). Andrew (parent) expressed a goal for his child to have access to technology and the skills to enable them to operate in a job similar to their peers. These findings showed similar expectations throughout the stakeholder groups that students with blindness and low vision, require the disability-specific skills of compensatory access and use of assistive technology to participate in work independently and efficiently to be competitive in the future job market.

Most of the students in this study (n = 5) indicated that they were confident in assistive technology. This finding contradicted the disability consultant, who reported that many of the school graduates she worked with to place in employment conveyed they were very adept with technology. However, they were relatively low in skills compared to their sighted counterparts. Recent studies (Brauner, 2019) found that students who reported being competent with technology in secondary school struggled to access tertiary education and spent significant time attempting to access materials. The possibility of students being over-competent in their technology skills was an interesting finding, as their proficiency may not be at the same level as their peers. Students with blindness and low vision will compete to gain and maintain employment in a competitive job market (Vision Australia, 2018). Therefore, having the knowledge and skills to access work content with assistive technology is important.

Braille literacy skills were identified in the literature as a predictor for individuals succeeding in higher levels of education and employment (Guerreiro et al., 2013). Despite this evidence, the use of braille has declined significantly over the past few decades (Toussaint & Tiger, 2010; Wang & Al-Said, 2014). Within this study, three students were braille readers, mainly using electronic braille (eBraille) devices for access, and one student used printed braille for maths and music. Both Monique (policy-maker) and Susie (disability employment consultant) noted that people with blindness were disadvantaged without braille if they did not have adequate literacy skills to read and write, as per their sighted peers. According to Guerreiro et al. (2013) braille had become redundant as adaptive technology devices such as magnification, screen readers, and accessibility options in mainstream technology capture and read-aloud text. However, acquiring information solely through auditory senses was viewed as demanding (Posey & Henderson, 2012) and requiring a large cognitive load with complex auditory processing skills (Argyropoulos & Papadimitriou, 2015; Fanshawe, 2017).

An interesting finding in this study was that students who were braille users (n = 3), preferred to use eBraille over printed braille, but all used screen readers as their preferred format. This finding was similar to Argyropoulos et al. (2019) who found that 96.2% of braille students often opted to use screen readers to cater to the high content of information received in the classroom. The students' slow speed for braille was supported by the findings of d'Apice (2020), who performed speed tests on 73 braille users, and found all but one student reading rate below the standardised reading score of their sighted peers. Other studies have found that braille takes significantly longer to read than print, which may explain why students use other technology such as screen readers to keep up with the academic workload (cf Mohammed & Omar, 2011). Additional barriers to braille were reported by both participants and the literature, such as social exclusion (Jessup, Bundy, Broom et al., 2018), inadequate teacher preparation for braille instruction (Argyropoulos et al., 2014), the high cost of braille devices (Anand, 2020), and frequent interruptions to braille access when technology was not functioning (D'Andrea, 2012). Therefore it was argued, that although braille remains important in the 21st Century (Neumann & Neumann, 2014), auditory technology should be considered as a complementary tool to access literacy. However, auditory outputs could not replace the essential skills of reading and writing provided through the tactile means of braille (Clark, 2014).

Self-determination to articulate their strengths and accessibility needs to employers was also identified an enabler for future employment. Participants within this study (n = 8) identified examples of students with blindness and low vision having confidence, independence, and skills to advocate for their needs within the workplace. Nabel (policy-maker) explained that as people with blindness and low vision will be going into competitive job markets, they need to have the self-determination skills to explain their disability and the modifications required in the workplace (Crudden, 2012; Wolffe & Erin, 2020). This is important as Cmar and Markoski (2019) asserted that when people advocate for their needs, it builds empowerment and self-realisation for them as a person. Conversely, people with blindness and low vision had lower confidence levels if others had made decisions for them or exhibited overprotective behaviours (Lindsay et al. (2021). Explicit teaching of self-determination enabled people with blindness and low vision to be confident to verbalise their needs in the workforce (Reed & Curtis, 2011).

The importance of orientation and mobility, or the ability to move independently and safely through the environment, was recognised as a vital employability skill by four groups of stakeholders. All employers within this study (n = 3) wanted to know how people with blindness and low vision would get to and from work, find their work station and move around the workplace independently. Orientation and mobility has been reported in the literature as one of the most difficult tasks in the workspace for a person with blindness and low vision (Blake, 2021). An interesting finding was that orientation and mobility applications were used by Kye (student) to move around and catch buses independently. These skills were a positive predictor for employment, as McDonnall (2011) found people with sound transportation skills and mobility evidenced to have 2.4 times greater employment opportunities than people who were unable to travel independently. The use of technology in orientation and mobility was also noted by Opie (2018b) who suggested that applications developed to plan journeys and technology, such as google maps, provided access to information to assist with independent travel. This study found that students with blindness and low vision who were confident in their orientation and mobility skills had increased independence to access future employment.

Career education, or learning about work was considered necessary knowledge by four stakeholder groups, including the students. Participants reported elements that they believed were important to future employability, such as knowledge about job types, the work tasks within different careers, workplace structures, and more practical tasks such as resumes and cover letters. Lund and Cmar (2020) explained that children with sight learn about work by observing people engaged in jobs within the community. However, for people, with blindness and low vision, barriers to employment may result from not knowing what careers were available (Kaine & Kent, 2013). Therefore knowledge about work needed to be explicitly explained to ensure students were aware of the skills and attitudes required of a worker (Lund & Cmar, 2020). Wolffe and Erin (2020) asserted that people with blindness and low vision needed to actively engage in a career education program as early as possible. This was important as early work experiences have been shown to predict successful outcomes to employment (McDonnall, 2011). Career preparation was also valuable to help students identify the skills and competencies required for job aspirations.

People with lived experience expressed being underprepared for transition to employment (Crudden, 2012). Susie (employment consultant) shared that it was important for young people to have prior experience in work, through doing chores, volunteering, or paid part-time jobs. She reported opportunities to be involved in work experiences helped students understand work and include the experiences on their resumes. These findings aligned with the study by Wolffe and Kelly (2011), who identified that experiences to work, provided people with realistic feedback about their performance and opportunities to interact with other people to develop social skills. Therefore learning about work was essential for the positive transition to employment.

Participants identified employability skills that were required for all students transitioning to employment, along with disability-specific skills that were unique to people with blindness and low vision. Common employability skills included cognitive skills of literacy, numeracy, general technology, and critical thinking skills. Additionally, soft skills, such as personal and social capabilities, were important for future employability. These skills were embedded within the Australian Curriculum in both learning areas and the general capabilities (ACARA, 2009, 2021). It is hypothesised that if students with blindness and low vision had the necessary skills to participate in learning, they would have access to the general employability skills required for future work.

Participants in this study identified seven of the nine disability-specific skills essential to participate in learning and required to access employment. These skills were: compensatory access, assistive technology, sensory efficiency, self-determination, orientation and mobility, social interaction skills, and career education to prepare for future work. Although recognised in the literature, the two other disability-specific skills of independent living and recreation and leisure skills were not identified by participants within this study as directly influencing the developmental outcomes. Stakeholders noted however, participation in recreation and leisure skills when social interaction was discussed.

Due to the unique access needs of students with blindness and low vision, disability-specific skills are additionally required to participate in learning and prepare for future employability. This finding was important as it identified the disability-specific skills were considered to be unique for students with blindness and low vision. Therefore, it is posited that disability-specific skills are the factors that influence employability for students with blindness and low vision. This finding has further implications for this study, as disability-specific skills are identified as the proximal processes within Bronfenbrenner’s Bioecological Systems Model.

8.3. Proximal Processes: Impact on Participation in Learning and Future Employability

Proximal processes are described as people, objects or systems which interact positively between the person and their environment (Bronfenbrenner & Morris, 2005). Although there were many barriers and enablers within the context of each level of the ecosystem in this study, proximal processes had the potential to transcend one system to have a powerful impact on the person throughout their development (Ashiabi & O'Neal, 2015). The Bioecological Systems Model purported that if proximal processes were in place, the person at the centre of the ecosystem would be advantaged (Bronfenbrenner & Morris, 2005). Conversely, there were negative effects if the proximal processes were not interacting with the person regularly over time (Merçon-Vargas et al., 2020).

Proximal processes were identified through an holistic review of the ecosystem to analyse what stakeholders believed were the key factors that interacted with the person to profoundly influence their developmental outcomes (Ashiabi & O'Neal, 2015). Specifically in this study, the disability-specific skills were identified as the proximal processes which interact with students with blindness and low vision to influence the developmental outcomes of participation in learning and future employability. This study found that when disability-specific skills were in place, regularly over sustained periods of time, students had opportunities to interact with learning and develop the necessary skills required for future employment. However, barriers existed when processes were not functioning or inhibited either through the person's characteristics, the context of the ecosystem and/or through lack of interaction, regularly over time. The following sections will discuss factors that stakeholders identified to influence the effectiveness of the proximal processes on the developmental outcomes of participation in learning and future employability.

8.4. Person: The Influence of a Person's Characteristics

The collective empirical data from this study highlighted 25 of 36 participants identified individual characteristics of a person that interacted with the proximal processes to enable or inhibit participation in learning and future employability for students with blindness and low vision. Bronfenbrenner and Morris (2005) identified attributes of a person which influenced their interaction with proximal processes. These characteristics included: demand characteristics (innate qualities such as age, gender, and physical appearance), resource characteristics (such as skills, intelligence, social, and material resources), and force characteristics (temperament, motivations, and persistence). This study evidenced the characteristics of students with blindness and low vision impacted their interactions with the disability-specific skills, which could be a barrier or an enabler to participation in learning and future employability.

The following sections will discuss these barriers and enablers identified by stakeholders in this study.

8.4.1. Barriers Which Decreased Access to Proximal Processes

Participants identified barriers existed for students with blindness and low vision when the individual had decreased access to the proximal processes due to personal characteristics, including a) being a teenager, b) impact of vision loss, and c) emotional implications of vision loss.

8.4.1.1. Being a Teenager

The demand characteristic of age, specifically being a teenager while studying in secondary, was identified by educators and people with lived experience (n = 4) as barriers to participation in learning. Participants identified increased emotional, social and academic pressures during this time, which according to stakeholders decreased engagement for many students in secondary schools. The impact of social forces for students with blindness and low vision was evidenced by Chris (student), who reported that they did not want to look different from their peers, so they purposely hid their learning needs in the classroom, so others were not aware of their disability. Chris explained that when they could not gain access through compensatory skills or assistive technology, they later gained assistance from their parent to access the content at home.

The impact of the teenage years in education has also been noted in the literature, with findings that students in secondary experienced depression and decreased mental well-being, which attributed to the significantly stressful life event of senior examinations and pressures of tertiary entrance scores (Perry et al., 2017). Further social pressures, such as drug and alcohol use (Kelly et al., 2015), sexual behaviour (Adimora et al., 2018), and peer bullying (Rajaleid et al., 2020) were also widely associated with this age group. While this barrier was not unique for students with blindness and low vision, the well-being of adolescents and completion of secondary education was identified as important for all students within Australia (CAG, 2018) and internationally (OECD, 2017). The recent study of Robertson et al. (2021) found that students with blindness and low vision had normative age-specific challenges, as well as complex issues surrounding their disability, which impacted their inclusion in secondary schools. This finding showed students with low vision had age-specific challenges and social pressures, which may impact interaction with disability-specific skills of compensatory access and assistive technology. For students with blindness and low vision, lack of access to the curriculum resulted in barriers to participation in learning.

8.4.1.2. Impact of Vision Loss

Levels of vision loss, specifically whether the student was blind or had low vision, impacted participation in learning by multiple stakeholders (n = 9). All stakeholders recognised that blindness and low vision influenced access to learning or employment. However, stakeholders had conflicting viewpoints as to the more invasive impact for students with blindness as opposed to students with low vision.

Several stakeholders considered the impact on the developmental outcomes for students with blindness was more profound than the impact for students with low vision. Participants identified students with blindness needed increased access to disability-specific skills, including compensatory access, assistive technology, braille access, and a cane to navigate through the environment. These stakeholders reported reduced impacts for students with low vision, as they were able access wider incidental learning and could use more simple tools for compensatory access such as magnification to enlarge print content. A recent study by Cmar et al. (2018) found that people with blindness were less likely to be engaged in employment than people with low vision. These findings could indicate the increased need for interaction with disability-specific skills were required by people with blindness, which may impact future employability.

Conversely, other participants in this study believed that for a student with complete blindness, the disability was more easily identified in the educational context. They explained this meant educators were more aware that the student could not access visual curriculum content and resulted in proactive modifications for the student. These stakeholders said that students with low vision had more significant barriers to learning as their access needs were overlooked in the educational context because their disability was not directly evident to teachers. These findings aligned with the research of (Lirgg et al., 2017), who identified that teachers felt better prepared to support students with obvious disabilities rather than covert impairments. Lirgg et al. (2017) proposed this may stem from initial teacher training, where limited information is provided to generalist pre-service teachers on catering to students with blindness and low vision in mainstream classrooms. The authors also suggested that examples provided in pre-service training were of overt disabilities such as blindness, rather than examples of students with low vision, which left teachers feeling underprepared to cater to the diverse needs of low vision within the classroom (Lirgg et al., 2017).

However, these conflicting findings could not be settled in the literature. A recent systematic review by Hopkins et al. (2020) reviewed studies that examined the impact on classroom performance by the level of vision loss. The review found the results were inconclusive as to whether blindness impacted learning more than low vision. Other studies showed that it was not vision loss itself that affected education, rather the functional vision of how a person uses vision and disability-specific skills to access their learning in a classroom (Silveira & Cantle Moore, 2018). This study identified that all students had unique barriers due to their vision loss which challenged their participation in learning. The findings from this study showed disability-specific skills such as compensatory skills, assistive technology, and sensory efficiency played a significant role in access to learning for students with blindness and low vision.

8.4.1.3. Emotional Implications of Vision Loss

Emotional force characteristics such as anxiety, frustration, and difficulty coping were identified as barriers to learning by participants (n = 11). This study found that many students with blindness and low vision had different frustration and anxiety levels, which may impact their ability to participate in learning. Educators in this study reported students with blindness and low vision who presented as anxious or frustrated when they could not access materials or use technology. Feelings of frustration were reported in the literature, particularly when technology did not work (Ampratwum et al., 2016). For other participants, vision loss was described as a significant emotional impact that influenced their ability to participate in learning. As an example, Chris and Emily (person with lived experience) acquired vision loss while at school and similarly expressed that their vision loss was very difficult to cope with emotionally. They told of feelings of depression, anger, and denial when trying to learn in the classroom. Chris shared that it depended on how mentally strong they felt on a particular day, whether they were open to learning. These findings were supported by previous research, which found that the socio-emotional impact of sight loss impacted a person's self-concept, mood, and social connectedness (Thurston et al., 2010). These findings were important for educators working with students with blindness and low vision, as anxiety and frustration have been discovered to negatively influence students' thought processes, impacting learning (Bhuvaneswari et al., 2016). Further, evidence from participants in this study showed that when students were experiencing emotional responses to vision loss, stress and frustration increased for students with blindness and vision impairment.

These barriers reported by participants, which related to the person's characteristics, influenced interactions with proximal processes, namely the disability-specific skills of compensatory access, assistive technology, and sensory efficiency. These barriers to the proximal processes of disability-specific skills impacted participation in learning within the classroom.

8.4.2. Enablers Which Promoted Access to Proximal Processes

Participants identified personal agency as an enabler that promoted interactions with the proximal processes.

8.4.2.1. Personal Agency

Within this study, independence and confidence to make decisions in learning were identified by participants (n = 12) as an enabler to participation in learning and future employability. Personal agency is described as a person's perception that they have influence and control over their life events (McLinden et al., 2020). According to McLinden et al. (2020), due to the significant barriers to accessing visual information, students with blindness and low vision are at risk of becoming more reliant on other people for support, which reduced personal agency and control over participation in learning. According to Hewett et al. (2018), students with blindness and low vision developed personal agency in learning when they

- accessed information independently (compensatory skills),
- advocated for their support needs in the classroom (self-determination), and

- moved confidently around the physical environment (orientation and mobility).

All students within this study attempted to make modifications to curriculum materials independently, where possible. For example, Charlie expressed they felt more confident making modifications as they became older and recognised their own needs to access information. This finding aligned with the work of McLinden, Douglas et al. (2016), who contended that as a student with blindness and low vision became older, they should be learning to access information independently, where possible. While all students were implementing compensatory skills to access information independently, not all of the participants in this study evidenced the disability-specific skill of self-determination, which was the ability and confidence to advocate for their accessibility needs.

While two of the students who participated in this study communicated independently with their teachers their preferred formats for independent access, the other four students said they did not feel comfortable doing so. Participants also reported feelings of domination rather than support within the classroom. They shared that they complied because it was difficult to tell a teacher, who was in a position of power, how best to present work to be more accessible for learning needs. Other reasons for not advocating for accessibility needs to teachers were reported, such as being seen as different than other students, not wanting to bother the teacher, and concerns that teachers would get angry if they asked for help (M. Thurston, 2014). This study found that not all of the students could speak up, whether this was due to lack of confidence or power considerations. Being able to express accessibility needs was an important component of personal agency.

All students within this study (n = 6) had received ongoing orientation and mobility training. According to Terry, a therapist, people with blindness and low vision need to learn orientation and mobility skills early, with support from trained and qualified orientation and mobility specialists, to develop confidence in the school, the community, and employment. These findings were consistent with previous research, which linked confidence in orientation and mobility skills as necessary disability-specific skills to promote personal agency (Hewett et al., 2018).

Preparing students to have personal agency for the transition post-school was identified as a focus for a several advisory teachers/therapists (n = 4). An advisory teacher shared, that they were working to increase students' compensatory skills and self-determination, so by the time students were in secondary, they were no longer needed. Other educators noted that asking students how they like to access materials and working through technology problems, was important for helping students to develop decision making and independence. These skills were important for students as it enabled them to control their learning and develop personal agency to take control of further education and employment (Hewett et al., 2018; McLaughlin & Kamei-Hannan, 2018; Opie, 2018b).

Many stakeholders (n = 25) reported the disability-specific skill of assistive technology as playing an instrumental role in developing personal agency through providing opportunities to make decisions about independent access to learning. The knowledge and skills to engage with technology were also noted as a predictor for success in education, tertiary, and employment (Ajuwon et al., 2016; Jones et al., 2018; Kelly & Wolffe, 2012). Participants in this study with blindness and low vision identified a variety of specialised and mainstream technology they used to access information independently. These devices included specialised equipment created especially for people with blindness and low vision, such as braille machines or JAWs speech-to-text programs, and mainstream devices such as smartphones, tablets, and computers, which were generally available to the public. Crossland et al. (2014) proposed that mainstream technology was becoming more popular as an accessibility tool for people with disabilities due to the technological advancement of accessibility tools which enabled the user to perform the same functions as specialised equipment for a fraction of the price.

The ability to use technology independently (n = 6) was identified as an enabler to participate in learning by participants in this study to gain access to content at the same time as peers. Five of the six student participants in this study said that they were confident using assistive technology and conveyed the importance of being skilled in assistive technology to access the work task at the same time as their peers. According to Opie (2018b), adequate training in assistive technologies enabled students to use technology to the full potential and engage cohesively, alongside their peers, with the academic curriculum.

Stakeholders in this study identified the ability to use assistive technology independently as having an important role in preparation for employment. Students expressed that assistive technology took a long time to learn, and it was important to learn assistive technology skills while still in school to prepare for employment. Students reported different approaches to gaining access to training in assistive technology when knowledge was not readily available in mainstream schools. Some students had weekly training with an assistive technology therapist outside of school hours, while other students preferred to learn through exploring technology independently. Finding ways to overcome barriers to accessing learning was an important finding in this study. It indicated that students were employing agency in their learning through accessing other supports within the ecosystem. Additionally, this study identified that it was essential to acknowledge the diversity of a students' ability and agency of their choices, which would be important personal characteristics in the context of employment.

This study found interactions between the person and the proximal process of disability-specific skills impacted participation in learning and future employability. When negative characteristics were present, they created barriers to the proximal processes, such as compensatory access, assistive technology and orientation and mobility. When positive personal characteristics were in place, they enabled disability-specific skills such as compensatory access and self-determination. This study identified barriers, such as the demand characteristic of being a teenager, the resource characteristics of vision loss and the force characteristics of emotions, which negatively influenced a students' ability to access learning. Additionally, the study uncovered force characteristics such as personal agency, which was reported to positively impact participation in learning and future employability for a student with blindness and low vision. These findings were significant because educators of students with blindness and low vision can consider ways of supporting students to overcome personal characteristics that impact the interaction of the disability-specific skills. Specifically, educators can focus on encouraging independence and the use of assistive technology to increase personal agency.

8.5. Context: Support Within the Ecosystem

An essential premise of the Bioecological Systems Model (Bronfenbrenner & Morris, 2005) was that a person does not learn in isolation but rather within an holistic environment with interconnected systems that influence an individual’s development outcomes. Stakeholders in this study revealed the barriers and enablers within the environment which interacted with proximal processes to influence the developmental outcomes. The following sections report on the barriers and enablers from the environment which impact the person’s engagement with disability-specific skills.

According to the majority of participants in this study (n = 27), a wide range of supports were required for students with blindness and low vision to order for them to participate in learning, at the same level as their peers. This finding supported the work of McLinden et al. (2020) who also framed a student’s development on the Bioecological Systems Model. McLinden et al. (2020) suggested the role of supports (such as classroom teachers, advisory teachers/therapists) while students were in school was to empower students to build personal agency in their learning. This would suggest that stakeholders would initially start with modelling to students how to use disability-specific skills. As students become older and more independent, support is reduced as confidence with the use of disability-specific skills increases as students learn to access (McLinden, Douglas et al., 2016; McLinden et al., 2020). Thus, the goal of support is that secondary students with blindness and low vision developed the agency to make decisions about using disability-specific skills to access participation in learning and future employment.

Supports were identified within the students' ecosystem and included factors from the microsystem (teaching staff, school supports, parents/carers, and peers) and the mesosystem (advisory teachers/ therapists). Additional supports in the exosystem included support provision from policy-makers (who determine resource distribution), policies in the macrosystem around education, disability, and employment, and attitudes of employers. This section examines barriers and enablers from the students' context, which influence interaction with the proximal processes.

8.5.1. Teachers' Support to Create Accessible Learning Environments

Participants reported a variety of support implemented to assist students' access to learning. When students could not access learning independently, all students reported receiving support from their classroom teachers (n = 6). These modifications included the provision of alternate formats through auditory, visual, tactile, and digital means and adaptions to the school environment (see Figure 8.1). Modifications included teachers reading out course materials, altered size, colour and contrast of printed materials, provision of brailled or digital materials, along with consideration of placement within the classrooms.

While many students shared unique and personalised methods that their teachers could provide access to the curriculum, students also noted that teachers were variable in their knowledge of providing accessible materials and learning environments. Participants revealed that many teachers had limited preparation in supporting students with blindness and low vision in the classroom and relied on support teachers within the school and expert advice from external advisory teachers and therapists to provide accessible materials for their students. Lack of teacher knowledge within schools was problematic for students with blindness and low vision. If teachers did not have the skills to support students in accessing the curriculum, students may not have had the same learning and preparation for employment as their peers.

Modifications	
Auditory	• classroom teacher read out content on board (Kye; student; Louisa, parent) • parent read out required text (Chris, student; Millie, parent) • teacher aides read printed material (Natalie, parent; Toni, teachers' aide) • recordings created to assist with content review (Luke, classroom teacher)
Visual	• enlarged materials (Chris) • altered size, colour, contrast or font on printed materials (Luke) • used of thick pens on the board (Kye)
Tactile	• provided alternate format of braille (Jo; Kye; Sam, students) • produced tactile graphics such as PIAFs and 3D printing (Kye; Andrew, parent)
Digital	• all of the students expressed a preference for digital materials to be provided prior to their lesson so they could access the materials through technology • uploaded information in school-based learning management systems (Charlie; Kye) • emailed material to the students (Chris)
Environmental	• consideration of placement within the classroom (Chris) • preparation of the school environment to identify hazards (Charlie, student) • peers assisted with orientation around school environment (Natalie, parent).

Figure 8.1 Modifications to Materials and Environment

Participants within this study (n = 3) explained that having a student in the school with blindness and low vision was rare, and as such, many teachers had not taught a student with blindness or low vision. Lack of prior interaction with people with blindness or low vision may have resulted in teachers being unaware of what modifications were required to ensure students access the curriculum and learning environment within the school (Cain & Fanshawe, 2020; Holbrook, 2015; Southcott & Opie, 2016; Siu & Morash, 2014). A participant confirmed this finding, stating that teachers were unaware of how to make modifications, due to a lack of knowledge of a student's disability. The advisory teacher explained that as a result, teachers relied on their own preconceived ideas or searched information online about blindness and low vision rather than gaining knowledge through more reliable sources, such as advisory teachers/therapists. A recent study examined educators' understanding of teaching STEM to students with blindness (Villanueva & Di Stefano, 2017). While participant numbers were small, this study showed teacher positionality impacted provision of inclusive education to students with blindness and low vision.

Lack of knowledge about students with blindness and low vision may have resulted in reduced opportunities for participation. Stakeholders reported that students missed out on participating in curriculum activities due to lower expectations or attitudes that did not understand students could access the content. As a result, others, such as teachers, support staff, or parents, completed the task for the student. However, findings from the literature showed that when work was done for the student, it provided the student with a false impression of their abilities and how they would succeed in employment (Crudden, 2012; Reed & Curtis, 2011).

The literature also identified a lack of information in teacher preparation courses to develop knowledge to cater to students with blindness and low vision (Ajuwon et al., 2016; McLinden et al., 2017). However, only one participant in this study identified teacher education as a factor that influenced support within the ecosystem. Terry (advisory teacher) suggested that older teachers in schools may have completed university before the inclusive education movement, which could relate to the lack of preservice teacher training to teach students with disabilities.

Knowledge and skills to include students within the classroom are fundamental to providing inclusive education and preparing students for the diversity represented in the community. Further, students who are not given the opportunity to engage in more challenging work tasks may become disempowered in their learning and may not build agency in preparation for their transition to the workplace. This knowledge suggests that it is important to include information about students with disabilities in initial teacher education programs to develop teachers' knowledge and understanding of the needs of students with disabilities to enable support within the classroom. Without specific knowledge of how to support students within schools, classroom teachers would not have the capacity to provide accessible materials, and students may miss out on developing knowledge of what modifications suit their learning needs best to develop agency in learning.

8.5.2. Support, Resources, and Development of Expert Knowledge Within Schools

Support within the school was also important. This included support from teachers, adequate time to prepare resources, technology to support resources, distribution of resources and access to professional development.

8.5.2.1. Support Teachers Within the School

All students and teachers (n = 12) reported that their schools had support teachers or support units to assist teachers in gaining the knowledge and skills to provide accessible content and teaching pedagogy, however levels of specialised knowledge of blindness and low vision within schools were diverse. Support teachers and teacher aides within the school were identified as providing assistance to classroom teachers to make modifications for students with blindness and low vision. While these supports appeared to be mechanisms put in place by the school to facilitate access to the curriculum, Luke identified that in his school, support teachers had general special education training and lacked specific knowledge in blindness or low vision. Brown and Beamish's (2012) research in Australian schools, found generically trained special education teachers within Australia did not always have the specific knowledge of blindness and low vision to make appropriate adjustments to the curriculum. Specialised knowledge was supported as important to create accessible materials and provided access within the changing and complex circumstances of working with students with blindness and low vision (Hehir et al., 2016; McLinden, Douglas et al., 2016).

8.5.2.2. Time to Prepare Resources

Interestingly, all of the education stakeholders (n = 16) noted the additional workload when teaching a student with blindness and low vision (Sapp &

Hatlen, 2010). Some additional duties included making modifications to learning materials, preparing an accessible classroom, and customising the teaching approach. Teachers reported that they had limited time to prepare resources and generally created modifications outside of work hours. Stakeholders also identified that barriers existed because secondary teachers had high numbers of students in their classes, and it was difficult to find time to support the diverse needs of all the students. A recent Australian study (Manuel et al., 2018) which examined the impact of workload on mainstream secondary teachers, found high workloads implicated both teaching quality and implementation of the curriculum in secondary classrooms.

Further studies recognised the increased workload of teachers when catering for students with disabilities in classrooms (Guardino, 2015). An additional consideration raised in this study was that secondary teachers might only teach students for one subject a week for 1 year, and despite a positive attitude towards inclusivity, may not prioritise modifications for a single student within their busy workload. The implications for students with blindness and low vision were that the high workloads expected of mainstream classroom teachers, along with additional time pressures to cater for modifications to the curriculum, impacted the capacity of teachers to have time to prepare curriculum and pedagogy to meet the needs of the students within the classroom.

8.5.2.3. Technology to Support Access to Learning

Inbuilt accessibility tools on mainstream devices were preferred by most students in this study, who reported that mainstream technology was more widely available and socially accepted in schools and the workforce. Charlie, for example, wanted to use the inbuilt voice function of the computer, rather than the specialised program of JAWs, as the accessibility function would automatically be loaded on computers in the workplace. The findings from this study were similar to McLaughlin and Kamei-Hannan (2018), who found that the use of mainstream devices decreased the social stigma for people with blindness and low vision. For this reason, Heather (advisory teacher) promoted the use of mainstream devices wherever possible, as she purported it was a more inclusive approach towards learning and preparation for future employment.

The inbuilt accessibility features on mainstream devices were advantageous to learning for Chris, who reported that they did not want to use specialised equipment in the classroom, as it made them appear different from their peers. This finding supported previous research (Byrne, 2014), which evidenced that some students with a disability may attempt to minimise visual modifications or use technology to disguise a disability. Chris' assertions also aligned with studies, such as Ingram et al. (2019), who found students with blindness and low vision had been bullied by their peers for using different equipment, which indicated that using blindness-specific technologies may impact social inclusion with peers. Other studies identified social exclusion, which showed that specialised equipment, such as braille machines, were noisy. As such, students were sent away from the classroom to use the equipment and isolated from their peers (Doepel, 2013).

There is existing evidence that students with blindness and low vision had more limited opportunities for participation in social interactions, felt excluded from their peers in the school environment, and experienced stigma from other students attributed to their disability (Whitburn, 2014a). Therefore the importance of the changing nature of technology was identified in this study as an enabler for students with blindness and low vision. This study revealed the increasing capability of mainstream devices to cater for people with disabilities was a positive move for inclusion, as mainstream technology was socially acceptable among students within secondary schools and in the workforce (Vision Australia, 2021c).

Limited knowledge of assistive technology within mainstream schools was identified by stakeholders (n = 6) as a barrier for students to access learning. Participants reported that classroom teachers and generalised support teachers within schools did not know enough about assistive technology to make suitable recommendations for students. Therefore teachers relied on the students to operate their own technology or assistance from external advisory teachers/therapists. Lack of knowledge of assistive technologies was reported to extend across the school context, which could inhibit the use of assistive technologies for students with blindness and low vision. Participants said that support might not be available to support students to use the equipment, and advice about suitable new technologies may be limited. The literature also identified barriers to the use of assistive technology within schools. Studies identified that classroom teachers lacked time to keep abreast of changes in technology (Ajuwon et al., 2016). Studies also showed that teachers and had limited training in assistive technology (Opie, 2018b) and lacked access to ongoing professional development to support students in the classroom (Sapp & Hatlen, 2010). Additionally, participants in this study noted that school administrators might not provide funding or prioritise compatible infrastructure without adequate knowledge about the importance of assistive technology. This study found that although technology could be an enabler to promote agency and access to learning, barriers within schools also impacted access that students would have to the disability-specific skill of using assistive technology.

8.5.2.4. Distribution of Resources

Allocation of financial resources to support students with blindness and low vision was identified by participants as a factor that influenced access to the proximal processes within the school. Stakeholders reported access to disability-specific skills as inequitable throughout schools due to the influence of systemic barriers and priorities within the school (Figure 8.2), identified systemic barriers within schools found to have impacted students' support within the ecosystem. It was acknowledged schools that enrolled students with blindness and low vision may require additional funding to resource support staff, equipment (such as braille machines or tactile printers), and professional development for school staff. Archie (policy-maker) shared that there was variability in how administrators in schools determined the needs of students with blindness and low vision, with some purchasing anything required to support the students and others not thinking it was their responsibility.

Systemic Barriers	
Accessibility	• impact on subject selection due to visual nature of content (Amanda, parent) • non-participation in all subjects (Andrew; Louisa; Natalie, parents) • extra-curricular activities and exams not accessible (Charlie, student; Luke, Nic, teaching staff; Nabel, policy maker)
School Systems	• school learning management systems incompatible with screen readers (Jo; Sam, students) • connectivity of assistive technology with school system (Andrew; parent) • lack of bandwidth in regional areas (Cliff, advisory teacher)
Knowledge of	• access to trials of suitable equipment (Barbara, advisory teacher) • knowledge of new technologies (Heather, advisory teacher)
Issue with technology	• time taken to use equipment to access curriculum (Chris; Sam, students; John, teaching staff) • cost of equipment (Natalie, parent; Kate, support teacher, Archie, policy maker) • reliability of equipment (John, classroom teacher)

Figure 8.2 Systematic Barriers Identified by Participants

In Australia, funding for students with disabilities was the responsibility of State and Territory governments. However, in practice, the allocation of resources for students with disabilities has been found to vary through all education sectors (AFDO, 2013) and individual schools (Mavropoulou et al., 2021). Inconsistencies in practice were also evidenced by participants in this study, who reported barriers to enrolment of students in schools, along with difficulties in accessing and implementing assistive technologies. Positive examples of inclusion were also provided, which outlined situations where students were supported with resources to ensure access to learning. These results were important findings, as they identified that decisions made in schools by people who may have had little knowledge of disabilities make decisions that may impact the provision of learning and future employability.

8.5.2.5. Access to Professional Development

Brown and Beamish (2012) acknowledged difficulty accessing training meant teachers of students with blindness and low vision received limited training to support their student's learning needs. Participants within this study (n = 14) identified limited opportunities for staff within the school to access ongoing training related to the specific needs of the students with blindness and low vision. Professional development was seen as necessary for all educators to be aware of the disability-specific skills required for a student with blindness and low vision to access information independently and make modifications within the classroom (Opie, 2018a). Conversely, lack of professional development was identified as an additional barrier to providing supportive learning experiences for students with blindness and low vision. Education stakeholders within this study advocated for more professional development within schools where students with blindness and low vision were enrolled to ensure teachers and support staff had the knowledge to support the students in the school.

This study confirmed the need for teachers for substantial professional development to feel prepared to meet the needs of students with blindness and low vision (Lohmeier et al., 2009) further expressed the need for professional development for parents to educate them on the importance of the disability-specific skills to access learning. While Pogrund (2017), suggested professional development should extend to all educators within the school. Participants in this study believed all stakeholders in the school, not just educators, required professional development when a student with blindness and low vision is enrolled. Empirical data from this study showed professional development should include staff throughout the whole school, including support staff, casual teachers, and teacher aides, to ensure the school, as a system, was supporting the unique needs of students with vision impairment. Furthermore, the study found that training for all school staff should be ongoing because students' needs changed over time, as did technology and school personnel. When teachers were aware of the needs of students with blindness and low vision, they were more capable of supporting their learning in mainstream education.

8.5.3. The Support and Influence of Parents/Carers

The influence of parents/carers in supporting students with blindness and low vision was identified by participants (n = 12). According to Sarah (therapist), parents/carers were important in education as they had worked with the students since diagnosis and were legally responsible for making decisions about their educational outcomes. Empirical data from this study shared that parents/carers also assisted students to access learning, by providing practical support such as reading curriculum materials to their students. The role of parents/carers in supporting education and learning has been found to increase attainment in education (McDonnall et al., 2012) and support students to transition to employment (Danaher, 2019).

Parents/carers were also shown to play a vital role in modelling attitudes and expectations around blindness and low vision to their child (Rainey et al., 2016). Attitudes of parents modelled positive expectations for the students about their education and future employment (Kim & Kim, 2015). Kate (support teacher) suggested that parents also modelled effective advocacy skills (self-determination) to their students. She asserted it was important for parents/carers to advocate for their child's needs within the school context to ensure adequate supports were in place to access the curriculum (Ratliff, 2020). In this study, two students in secondary were beginning to advocate for their own learning needs in the classroom. This finding was important, as the ability for students to advocate for their own needs was evidence that students displayed evidence of personal agency (Hewett et al., 2018; McLinden, Douglas et al., 2016; McLinden et al., 2020). It is posited from the analysis of results in this study that parents/carers play a role in developing students' skills for advocacy through modelling effective advocacy to the student. However, as the students entered secondary, students should begin to advocate for themselves, where possible.

Conversely, participants in this study identified overprotection of a child with blindness and low vision (n = 4) as a barrier to students developing independence. Stakeholders shared situations where parents would not allow their children to engage in similar opportunities to their peers. Pinquart and Pfeiffer (2011) suggested overprotection may stem from parents being concerned about their child's safety, which according to Munro et al. (2016) lowered expectations and participation for students with blindness and low vision. Similarly, in their studies, of Australian students in mainstream schools, Cain and Fanshawe (2020) purported that students with blindness and low vision reported they were given less opportunities to participate in activities than their peers. Susie (employment consultant) added that chores, and part time jobs helped develop skills needed in the workforce, specifically confidence and independence (Crudden, 2012). Munro et al. (2016) suggested that it was difficult for parents/carers to balance overprotection and tools for advocacy. However, for students with blindness and low vision, the confidence, and independence provided from participating in age-appropriate activities was an important enabler to development. The ultimate goal for students was to have the confidence to effectively advocate for their own needs within the school environment, which would ultimately transfer to the workplace.

8.5.4. Interactions With Peers

The disability-specific skill of social interaction was identified by participants (n = 16) as an important part of social inclusion for students in mainstream school. Feelings of being included in school build a student's confidence (Khada et al., 2012) because self-esteem was developed based on a person's perceptions of what others thought of them (Dawn, 2015). Jessup, Bundy, Hancock et al., (2018) argued that full inclusion within schools did not solely concern academic inclusion but also social inclusion.

Interviews with the participants with lived experience afforded insight into their memories of education in mainstream schools. All four participants reported "appearing different" or "feeling different" to their peers, which they verbalised impacted their feelings of inclusion within schools. For the students currently in school, five of the six students reported feeling included in the school. Chris, who had acquired vision loss, said they were different from the other students and purposefully minimised their modifications not to appear different from their peers. The literature shared similar experiences, with findings that social exclusion was exasperated when students looked different from their peers, through the use of specialised technology (Jessup, Bundy, Broom et al., 2018) or by wearing glasses (DeCarlo et al., 2012). Other research indicated that teachers' aides providing specific support could stigmatise students (Reed & Curtis, 2011). However, some of the classroom teachers in this study considered the social needs of students and tasked teacher aides to support all the students in the classroom. This finding was important, as it identified that some educators were aware of the social needs of students and were able to implement ways to provide supports within the classroom, through inclusive practices.

Participants in the study also expressed the benefits for students with blindness and low vision to be involved in activities with their peers. Social interaction was seen to provide opportunities to develop a sense of belonging with sighted peers and peers with blindness and low vision. Explicit teaching of social skills were suggested, as students with blindness and low vision tended to have smaller friendship circles (Robertson et al., 2021) and, therefore, may not have had as many experiences interacting with peers. To prepare for the workplace, students with blindness and low vision could be taught courteous behaviours. Social Interaction skills would include responding to greetings, respecting personal space, and looking at people when speaking, which required compensatory skills when you could not see the other person (Zebehazy & Smith, 2011). Sarah advocated that students with blindness and low vision, also should be aware of social media to engage with their peers online. This finding was supported by Opie (2018a) who concurred social media access was an important communication tool, and helped students to stay up to date with their peers providing a feeling of belonging (Kelly & Wolffe, 2012). Social interaction is important for students to feel valued and provides opportunities for students to authentically develop communication skills and work in a team, which are important predictors of success in the workforce (Crudden, 2012; McDonnall, 2011).

8.5.5. Access to External Supports

Due to the low incidence of blindness and low vision, advisory teachers and therapists are utilised in all states and territories in Australia to provide specialised knowledge and expert advice within schools to support students' learning. The role of advisory teachers/therapists are to ensure students with blindness and low vision had access to the curriculum at the same level as their peers (McLinden, Douglas et al., 2016). The participants explained that within this State, managers within Statewide Vision Services deployed advisory teachers who consulted to schools, to provide specialised support and professional development within schools. Support also included explicit teaching of disability-specific skills to students, including compensatory skills, assistive technology, braille literacy, strategies to support social inclusion, and orientation and mobility skills.

Support from advisory teachers/therapists was identified as an enabler to learning by stakeholders (n = 11), specifically students, teaching staff, and experts. An example of the support provided for students with blindness and low vision, was explained by Jaime, who was educated in a rural government school. Jaime reported that the advisory teacher supported teachers in developing their knowledge about blindness and low vision and made modifications necessary to access the academic curriculum. Jaime shared they also received individual support from the advisory teacher, who helped them make their modifications and develop the confidence to advocate to their teachers for their preferred accessibility. Jaime also worked with an assistive technology therapist to learn about technology to access the curriculum. Jaime further stated that working with advisory teachers/therapists helped develop employability through communication skills for interacting in teams and using assistive technology to access workplace information.

Specialists play a vital role in supporting students with blindness and low vision as they have a unique understanding of blindness and low vision within education. Advisory teachers/therapists can interact with others within the ecosystem (such as parents, teachers, policy-makers) to support the holistic needs of the students (McLinden et al., 2017). While some argue that students with blindness and low vision have been privileged to receive support through advisory teachers/therapists in schools, as most other disabilities do not provide this kind of support (Brown et al., 2013). Opie (2018b) justified the requirement for support and argued that inaccessibility to the curriculum for students, who were blind or had low vision, was a unique barrier to learning which required specialised support for classroom teachers. Support from advisory teachers/therapists was identified as an important role in providing expert knowledge to support schools to cater for the unique needs of students with blindness and low vision.

8.5.6. Barriers to Accessing Advisory Teacher/Therapists

This study found that all Catholic, Government and Independent schools, throughout the State, were eligible for the external supports. However, the ability of advisory teachers/therapists to support the student with blindness and low vision, varied depending on the specific school context. This meant that not all students received the same or equitable provision of services from advisory teachers/therapists. Barriers which impacted the external support provided by advisory teachers/therapists are outlined in (Figure 8.3). These barriers existed by the thoughts or actions of other stakeholders in the ecosystem (students, parents, teaching staff, school staff and policy-makers) and from the advisory teachers/therapists themselves. The result of barriers in accessing advisory teachers/therapists negatively impacted on the proximal process to provide support within the ecosystem.

Most of these barriers have previously been identified in the literature, as explored in Chapter 2. However, two novel findings were identified—not all schools wanted the advice of external experts, and not all the advice from experts was considered useful.

Students	• profound impact on person from blindness or low vision (Archie) • unwilling to work with advisory teacher as may look different (Chris) • does not have agency (Heather; Monique) or confidence (Carole; Terry) to make modifications independently • time within the curriculum to access disability specific skills (Monique)
Parents	• negative attitudes of parents to child receiving support in schools (Sarah) • lack of understanding of importance of disability specific skills (Toni) • unable to advocate for student needs to school (Kate)
Teaching staff	• decreased expectations of people with disabilities (Terry) • teacher anxiety over teaching student with blindness or low vision (Carole) • high number and turnover of teachers in schools, relief teachers especially in rural areas – difficult to maintain teacher knowledge (Barbara; Nic) • frequency of training limits impact of change (Kate; Luke) • willingness to implement technology (Heather)
Schools	• external services are optional – up to school how this knowledge is received and implemented (Cliff; Barbara) • understanding of decision makers within schools of disability specific skills (Carole; Cliff ; Heather; Sarah) – how to fit in overcrowded curriculum (Monique) • choices to employ teacher aides instead of qualified advisory teachers (Monique) whole school awareness of equipment (Heather) and resources required (Kate) • geographic locations – to remote to access to support on regular basis, lack of infrastructure or access to suitable technology (Barbara; Cliff)
Advisory teachers/ therapists	• high caseloads impacting time spent in schools (Archie; Jorge; Monique) • large travel in rural areas impacting frequency of service (Archie) • untrained and inexperienced advisory teachers, with little mentoring (Barbara) • access to ongoing training especially with diversity within caseload (Barbara) • keeping abreast of technology changes – including training and trials of equipment (Barbara; Carole; Cliff) • opportunities to network, discuss cases with other advisory teachers (Barbara) • not all teachers trained in braille, limits access for students (Monique)
Policy-makers	• difficulty with recruitment of qualified and experienced staff (Archie; Nabel) • lack of Australian wide policies for support of students (Monique) • inaccessibility of external exams (Charlie; Jorge)

Figure 8.3 Barriers for external supports by advisory teachers/therapists

Although the policy-makers claimed that schools welcomed the advice of expert teachers, one third of advisory teachers (n = 2) reported that the there was a lack of understanding in schools about the role of advisory teachers/therapists. Cliff shared that one of the biggest barriers was when he went into schools, and not all schools desired or implemented the advice. Similarly the Queensland Disability Review (Deloitte Access Economics, 2017) found that some schools refused to accept specialists within the schools, as they did not understand the collaborative role that specialists have in the system. Mavropoulou et al. (2021) noted a diversity in understanding by administrators, as to what is required to support students' inclusion in mainstream schools. The results of this study conferred with these findings, that while advisory teachers were provided to support students and teachers with expert knowledge, not all administrators in schools understood the value of this support for the student. This finding was important as not implementing or accessing expert advice from specialist advisory teachers/therapists, was a barrier to implementing support within the ecosystem.

Advisory teachers/therapists and policy-makers also identified that the advice from advisory teachers was not always considered useful, specifically when advisory teachers/therapists were lacking expert knowledge in education of students with blindness and low vision. Stakeholders told of the lack of trained and qualified advisory teachers/therapists within the state to be able to provide advice staff within schools and the difficulty of hiring people with qualifications in both metropolitan and rural and remote schools. As a result, untrained and inexperienced advisory teachers/therapists were providing advice in schools, as to how to support students with blindness and low vision. According to a policy-maker, this situation was familiar across Australia, and relied on the qualified staff who were in the field, mentoring newer advisory teachers/ therapists, which added to their already high workloads. This study highlighted that when advisory teachers/therapists did not have specific knowledge of students with blindness, this created a barrier for support within the ecosystem.

8.5.7. *Collaboration Between all Stakeholders*

This study identified that a wide range of stakeholders were available to support students with blindness and low vision to gain access to the curriculum and the disability-specific skills to access learning independently. This study produced results that showed diverse findings of support within schools. For example, advisory teachers reported that some schools did not want their services or value their knowledge, which was a barrier to the developmental outcomes for students with blindness and low vision. Participants also shared positive examples of the developmental outcomes of *participation in learning* and *future employability* when the ecosystem's support worked together. A recent study by Jortveit and Kovač (2021) found that when stakeholders all work together, with high expectations for the students, mutual recognition for each other, and good communication, students' outcomes are more likely to be successful. Natalie (parent) also shared the importance of good communication processes between all stakeholders to ensure support for students with blindness and low vision in learning.

Indications of collaboration and communication were evident within the ecosystem. Most of the students in this study (n = 4) reported that teachers asked them how they liked to learn best and many of the students (n = 3) had the confidence to explain their preferred formats in the classroom. When students could not access work independently, they had strategies to seek assistance from classroom teachers, parents, advisory teachers, therapists, and peers. Students having agency in collaboration and communication is an important finding. It uncovers that some students use supports to build their knowledge of disability-specific skills and develop independence to participate in learning.

This study showed that positive attitudes of stakeholders, provision of resources, and collaboration between stakeholders had a positive impact on the interaction of a person with the proximal processes of disability-specific skills. Participants identified that support was provided in modelling disability-specific skills, the explicit teaching of disability-specific skills, and empowering students to use disability-specific skills to participate in learning independently. However, barriers existed when students did not have regular access to specialised knowledge and support, either a dysfunction within the support system or the lack of access to qualified advisory teachers/therapists. Barriers also existed if resources were not provided or prioritised in schools.

It was further identified that policy-makers had a role within the exosystem, which influenced students with blindness and low vision within schools. Policy-makers such as managers of Statewide Vision Services and external disability organisations made decisions about resourcing to provide resources and allocation of advisory teachers/therapists. This study found that policy-makers had difficulties hiring qualified and experienced staff, which provided a barrier to the impact of advisory teachers/therapists to support understanding within schools of the effects of blindness and low vision. Further educational, disability and employment policies exist in the macrosystem, which influences educators' and employers' decision-making, which ultimately impact the person at the centre of the ecosystem.

The need for collaboration of all support systems was vital for an ongoing participation in learning and future employability focus, as direct links between well-functioning support systems and positive transitions to employment have been identified in the literature (Cavenaugh & Giesen, 2012; Hewett et al., 2014; Kurtović & Ivančić, 2019). It is argued from this study that systems working in harmony provide opportunity for students with blindness and low vision to participate in learning and future employability.

8.6. Time: Influence of the Chronosystem on Proximal Processes

Within the Bioecological Systems Model, the chronosystem is concerned with the time that the individual interacts with the proximal processes and the influence of the major life events and transitions that occur in the person's lifetime (Bronfenbrenner & Morris, 2005). Specifically for students with blindness and low vision, this refers to the time interacting with the proximal processes of disability-specific skills:

- microtime: the amounts of time students have access to disability-specific skills, and
- macrotime: changes to the influence of the proximal processes over time and generations, due to changes in technology and changes in education, disability and employment policies.

8.6.1. Microtime: Time Available to Explicitly Teach Disability-Specific Skills In Schools

Proximal processes need to interact with the person regularly over sustained periods of time to influence the developmental outcomes under consideration (Bronfenbrenner & Morris, 2005). This study identified that students with blindness and low vision each had differing amounts of time to interact with disability-specific skills due to barriers and enablers within the ecosystem. The person's character, personal agency, and support within the ecosystem influenced interactions with the proximal processes.

This study revealed that many classroom teachers within schools were unaware of the unique access needs of students with blindness and low vision and may not understand the influence of disability-specific skills for students to participate in learning. As a result, time to explicitly teach disability-specific skills may be limited (Opie, 2018a). Decreased interactions could impact the developmental outcomes of participation in learning and future employability. The participants in this study also noted that support teachers in schools might not have specialised knowledge in blindness and low vision to assist students in implementing assistive technology and compensatory skills to be independent in learning. Further, although advisory teachers/therapists were available, due to high caseloads and lack of qualified teachers, discrepancies existed in accessing time with the advisory teachers/therapists (Brown & Beamish, 2012).

Decreased qualified support, were especially noted in rural and remote geographical locations (Tuwaym et al., 2018). Participants reported decreased opportunities to access assistive technology devices in rural and remote areas, with limited equipment available and lower bandwidth within school systems. Despite these barriers, Jaime, who lived in a rural area, reported having a collaborative support system that empowered them to develop compensatory access skills. Jaime also said they had the use of equipment and the self-determination to decide what assistive technology would facilitate curriculum access. Jaime was able to independently access most of the work in the classroom and move around the school independently. Jaime's case study demonstrates a well-functioning ecosystem, with regular and sustained interactions with the proximal processes of disability-specific skills. When students have time in schools to access disability-specific skills, it is an enabler. When students do not have access to support to develop disability-specific skills regularly and over sustained periods of time, it is a barrier.

Furthermore, these findings also evidenced the role of support from within the ecosystem to empower students to develop personal agency. When students have access to knowledgeable support, who can assist students to develop the disability-specific skills, it is an enabler to participation in learning. When students do not have the opportunity to develop knowledge of the disability-specific skills during secondary school, it is a barrier to gaining agency, which is required in future education and employment.

8.6.2. Macrotime: Changes to Proximal Processes Over Time

Macrotime was also evidenced to impact access to disability-specific skills through changes in proximal processes over time. Through exploration of the chronosystem by interviewing people with lived experiences, it was also noted that changes have occurred over time, such as the visual, multimedia format of the Australian Curriculum and increased knowledge and access to technology. People with lived experience shared their experiences of mainstream secondary classrooms and reflected that curriculum materials were either braille copies, or paper materials, accessed by magnification tools. Braille users with lived experience recalled that they often received their braille later than their peers received their materials. They were reliant on the people in the support unit, who brailled the curriculum resources.

Students currently enrolled in mainstream secondary classes reported their experiences of trying to access curriculum materials in the classroom independently. Although much of the content is multimedia and visual, students reported accessing their materials in digital format to output on a refreshable braille device, screen reader, or through electronic magnification on the student's personal device.

An important finding in this study was that all people with lived experience of blindness and low vision (n = 4) reported that they did not receive any training on assistive technology while they were at school, either because technology was not available, or training was not offered in the school. These participants reported that keeping up with the knowledge and skills to operate assistive technology, at the same time as work content was difficult in the workplace, which was a barrier to maintaining employment. The literature also identified barriers to employment for people with blindness and low vision being employer concerns over access to information, through use of assistive technology (Vision Australia, 2021a, 2021b). The findings of this study show that current students have increased access to knowledge and skills to use assistive technology to access information independently. The findings indicate that confidence with assistive technology may have the potential to increase access to employment for the current generation, who have been identified in this study as displaying agency through learning how to use technology to access information.

8.7. Summary

Using the framework provided by Stake's (2005) *Multiple Case Study Analysis*, this chapter discussed the findings from the empirical data collected through interviews from students and stakeholders within their ecosystem to uncover barriers and/or enablers to participation in learning and future employability. The results showed a number of key findings that may have possible influence for future employability for students with blindness and low vision. Using the Revisualised Bioecological Systems Model (based on the work of Bronfenbrenner & Morris, 2005) as introduced in Figure 3.4, the results of this study have been described throughout the data chapters and collated on Figure 8.4.

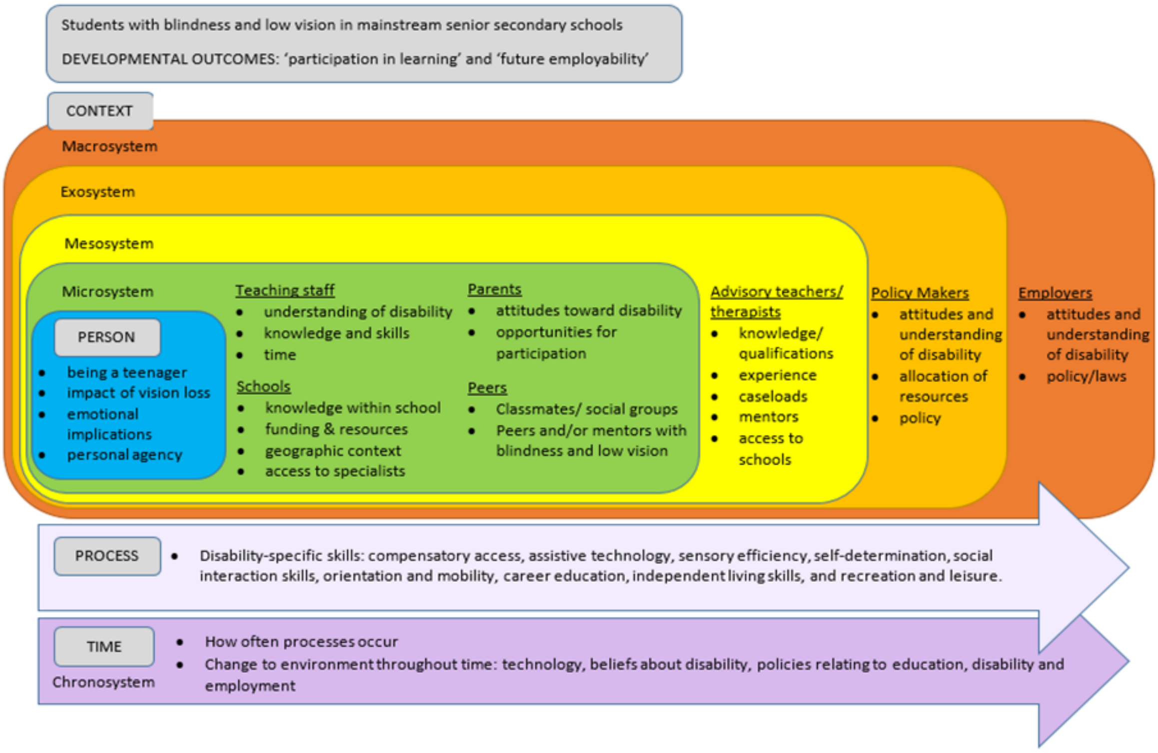

Figure 8.4 **Barriers and Enablers to Participation in Learning and Future Employability for Students with Blindness and Low Vision in Australian Mainstream Secondary Classrooms**

8.7.1. Developmental Outcomes of Participation in Learning and Future Employability

This study showed that participation in learning and future employability are two interconnected developmental outcomes that are desired for students with blindness and low vision in mainstream secondary schools. The outcomes directly align with the educational goals for students in Australian schools (Education Council, 2019). Discovering that the developmental goals are interrelated is an important finding, as this links participation in learning in secondary school and future employability. This means if students with blindness and low vision can participate in the Australian Curriculum content, they will also be preparing for future employment.

8.7.2. Disability-Specific Skills Are Proximal Processes

This finding supports previous research that blindness and low vision is a unique disability. Due to the visual nature of the Australian Curriculum, access to materials are not always accessible for students with blindness and low vision. Modifications to the materials, pedagogy, and the environment are required through the use of disability-specific skills, such as compensatory access, assistive technology, and orientation and mobility. Disability-specific skills were identified as proximal processes in the bioecological system of a person with blindness and low vision. Proximal processes are an enabler when the person can regularly interact with the disability-specific skills. However, proximal processes can be a barrier if dysfunctional or not available through regular and sustained interactions.

An important and novel finding of this study is the identification of disability-specific skills as the proximal processes in the ecosystem of a student with blindness and low vision in mainstream secondary school. The finding is crucial to understanding the diversity of developmental outcomes for students with blindness and low vision. Identifying disability-specific skills as proximal processes recognises the profound impact these skills have on the developmental outcomes. Specifically for students with blindness and low vision, this means that despite individual characteristics and educational context, if students can have regular and sustained interaction with disability-specific skills, they will have the optimal chance of success in participation in learning and future employability.

8.7.3. Barriers and Enablers for Proximal Processes

This study identified barriers and enablers for proximal processes through the Bioecological Systems model of person, context, and time (Bronfenbrenner & Morris, 2005).

Individual characteristics identified as barriers to enabling the proximal processes and therefore impacted development included being a teenager, the vision loss itself, and the emotional implications of vision loss. When these personal barriers were in place, it reduced the interactions with disability skills. For example, when a student did not want to look different than their peers, they did not want to use the disability-specific skill of assistive technology and therefore could not access learning. On the other hand, personal agency in learning was an enabler. Confidence and the ability to make decisions about how to access work independently enabled students with blindness and low vision to interact more frequently with disability-specific skills and begin to make goals about their learning, which was a desired skill for future employability.

The students' context and support from stakeholders within the ecosystem influenced interaction with proximal processes. It was an enabler for students when they had access to knowledgeable teachers, supportive parents and peers, and resources within their microsystem. Advisory teachers and therapists from the mesosystem provided specialist knowledge to assist students and their classroom teachers in interacting with proximal processes. However, when schools did not have the resources or value the expert advice of the advisory teachers/therapists, this provided a barrier to learning about the disability-specific skills.

The chronosystem impacted interaction with proximal processes in two ways. First, to be effective, proximal processes must be available regularly and over a sustained period of time. When students did not have access to proximal processes because they lived in rural or remote areas, with limited internet connectivity and reduced service from advisory teachers, interaction with the disability-specific skills may be reduced. The second impact of the chronosystem is from changes to the proximal processes over generations. In this study, it was revealed that technology had changed significantly. People with lived experience had little access to disability-specific skills due to teacher attitudes and limited training and access to technology. However, for current students with blindness and low vision, the increased capability of inbuilt accessibility tools in mainstream devices meant that students had access to socially inclusive assistive technology to participate in learning. Furthermore, all students had regular and ongoing training to learn skills to interact with the proximal processes from a very young age.

This final finding was crucial to the overall research aim of this study, which was to examine why despite the changes in legislation, employers' attitudes towards disability, and technology, only 24% of people with blindness and low vision are in full-time employment (Vision Australia, et al., 2018). The results from this study identify the disability-specific skills as the proximal processes which impact participation in learning and future employability. These findings demonstrated that when proximal processes were in place, they acted as an enabler. Conversely, when proximal processes were not in place, or not in place regularly enough to influence the person's development, they acted as an inhibitor to participate in learning and develop knowledge and skills for future employability.

Therefore this study concludes that the proximal processes are crucial for participation in learning and future employability. To enable the current generation to have access to employment in a competitive job market, students must have:

- disability-specific skills, modelled and explicitly taught in an appropriate sequence to empower students to gain personal agency
- support within the ecosystem, including specialist knowledge from advisory teachers/therapists and provision of resources, is collaborative to empower students as they are learning to access education and for transition to independence in employment, and
- proximal processes in place regularly and over a sustained period of time.

The following final chapter will summarise the contribution to conceptual knowledge and practice from these conclusions. The limitations of this study will be presented, along with recommendations for future research and practice.

Chapter 9. Conclusion

9.1. Introduction

The primary purpose of this study was to develop an understanding of factors within mainstream secondary schools that enable and/or inhibit access to learning and preparation for the transition to employment for students with blindness and low vision. This study was undertaken at a critical time because employment rates for people with blindness and low vision remain low. This situation is concerning given the existence of an international legislature advocating equity, changing attitudes towards disability, and increasing use of technology to support blind and low vision people (Blind Citizens Australia, 2020; Vision Australia, 2021a; Vision Australia, 2018). Understanding of the role that secondary education has in assisting students to be “future ready” (Australian Government, 2019), this study explored what factors may or may not inhibit this success.

Limited studies existed about students with blindness and low vision and their experiences related to their learning and future options post-schooling, including the disability-specific skills needed to gain employment (Allman & Lewis, 2014). To fill this gap, investigating the perspectives of a range of stakeholders was necessary to know what helps these students have equitable access to positive post-schooling options. Further, no study has been located which has looked at proximal processes within the Bioecological Systems Model to conceptualise the issues associated with students’ experiences of blindness and low vision in secondary schooling and how these experiences impact on their ability to seek employment or further education after school.

As highlighted above, this study drew on the collective knowledge of students with blindness and low vision and people identified within their holistic ecosystem of learning: parents/carers, teachers, advisory teachers, therapists, policy-makers, and employers. Insight was also gained from people with lived experience who had previously been involved in mainstream education and employment. As such the Bioecological Systems Model Bronfenbrenner and Morris (2005) was used to identify and recruit multiple stakeholders to gather an holistic understanding of the perspectives within the ecosystem and consider the implications for future employment. The stakeholders' experiences were collated and synthesised to answer the research questions developed to guide the exploration of this study. The research questions were:

- What do a range of stakeholders perceive enables and/or inhibits access for secondary students with blindness and low vision, in relation to participation in learning and future employability?
- How do the findings from these perspectives relate to the Bioecological Systems Model in identifying barriers for students with blindness and low vision? and
- What are the implications of this knowledge, for future employability and practice, for educators?

This chapter provides an overview of the thesis, outlines the study's contribution to theoretical knowledge and practice, along with noting limitations and recommendations for future research to address Research Question 3:

- What are the implications of this knowledge, for future employability and practice, for educators?

9.2. Overview of Thesis

In an overview of the thesis, Chapter 1 introduced the research problem and significance by outlining the impact of blindness and low vision on a person's development and employment opportunities within Australia. Guided by a focus on improving the mainstream secondary school experience for students with blindness and low vision, the chapter presented research questions pertaining to processes that enabled and/or inhibited access to education and ultimately preparation for employment.

Chapter 2 positioned the investigation of the research problem within the current literature. The review of the literature summarised the historical process for the education of students with blindness and low vision, and the current practice of inclusion of students with blindness and low vision within secondary schools. It outlined barriers and enablers to education that were identified in previous research, including access to resources and the structure of school systems and support within these confines. Finally, issues related to job readiness and ultimately employment were examined in the literature, including employer attitudes, access within the workspace, and future employability as students transition from education to employment.

Chapter 3 introduced the theoretical framework used in this study—the Bioecological Systems Model proposed by Bronfenbrenner and Morris (2005). The chapter outlined the suitability of this model for investigating issues for blind and low vision secondary students and shared applications and criticisms of the model for educational, qualitative research.

Chapter 4 outlined the research methods used in this study. Interviews were used to collect the empirical data and understand the meaning of the perspectives of multiple stakeholders within the ecosystem of students with blindness and low vision in secondary schools. The recruitment and data collection was centred on understanding a wide range of experiences and enabled the voice of multiple stakeholders within the students' ecosystem. Through this research design and the participants' voices, the researcher constructed meaning to identify barriers and enablers to participation in learning and for future employability. A focus on the congruence of the research design, outlining the connection between the analytic process and the data findings to the research questions, are displayed in Appendix C.

Chapters 5, 6, and 7 shared research findings from the stakeholders interviewed for this study. The participants' findings shared how the visual nature of the Australian Curriculum meant that materials were not always accessible for students with blindness and low vision. Therefore, modifications were required to access the curriculum content. Students described how their schooling focused more on the academic needs of the curriculum rather than the development of disability-specific skills for their preparation for employment. Education professionals related the importance of explicitly teaching disability-specific skills to ensure equitable skill development for students with blindness and low vision, which their peers learned incidentally through vision. Other stakeholders recognised the individual nature of each student and their prior experiences, which influenced participation in learning and future employment.

Using the framework provided by Stake's (2005) *Multiple Case Study Analysis* approach, after outlining the data from each of the cases in Chapters 5 to 7, the findings were discussed collectively in Chapter 8. Disability-specific skills were identified as proximal processes which interacted with the student with blindness and low vision to influence the developmental outcomes of participation in learning and future employability. They acted as enablers when proximal processes were in place and operated effectively for students with blindness and low vision. Conversely, proximal processes were barriers to the developmental outcomes when not in place or not regularly interacting over sustained periods of time.

This final chapter, Chapter 9, introduces a revisualised framework proposed to encompass Bronfenbrenner and Morris' (2005) Person-Process-Context-Time (PPCT), in the visual modelling of the Bioecological Systems Model (see Figure 3.2). It is envisaged this model will assist future researchers to encompass an holistic approach in their research design and analysis. The chapter outlines the synthesis of the findings from this study and situates the significance in terms of contributions to the field, in research and practice. The study concludes by making several recommendations that aim to address low unemployment rates for people with blindness and low vision.

9.3. Contributions of This Study

Significantly, this study contributed to new knowledge by providing a revisualised Bioecological Systems Model for future research. The study has made a number of significant contributions to the field of research within inclusive education and specifically for students with blindness and low vision:

a) a revisualised Bioecological Systems Model was developed to examine the ecosystem of individual students or groups of students on a caseload
b) several evocations related to the improved practice are noted, and
c) contributions to the prospect of employment through the accreditation of a national scope and sequence of disability-specific skills for students with blindness and low vision resulted.

9.3.1. Revisualisation of the Bioecological Systems Model

A framework to revisualise Bronfenbrenner's Bioecological Systems Model has been developed in this study to examine the ecosystem in an holistic approach that could be generalised to research other students or contexts (Figure 3.4). This was in relation to the findings from Research Question 2; How do the findings from these perspectives relate to the Bioecological Systems Model in identifying barriers for students with blindness and low vision?

When considering the conceptual framework for the study, the Bioecological Systems Model was deemed most suitable for a qualitative study within education, as the proximal processes are a valuable tool for identifying and displaying barriers and/or enablers within the ecosystem (Bronfenbrenner & Morris, 2005). Unfortunately, Bronfenbrenner was unable to visualise a model for this theory before his death in 2005, which led many to critique the work as being too vague to conceptualise (Wakefield, 1996a, 1996b; Xia et al., 2020). While initially intending to use Doughty and Moore's (2020) (Figure 3.3) model to visualise the ecosystem, when working with the data findings, the model lacked the embedded inclusion of the chronosystem. The inclusion of time was necessary for this study, as time had generated changes in education for students, with blindness and low vision, through technology (McDonnall et al., 2019), beliefs about disability (Cullen, 2011), and policies related to education, disability and employment (Vision Australia, 2018).

These changes within the chronosystem influenced the proximal processes on the person within the ecosystem as technology had improved, attitudes towards disability changed, and policies were implemented into practices.

Therefore, it was necessary to revisualise the model (see Figure 3.4) to encourage a broader perspective of what students with blindness and low vision might experience. It also enabled a more holistic focus for the research study's discussion and presentation of findings. The revisualised Bioecological Systems Model can be used as a tool for future researchers when examining individuals within educational and broader ecosystems.

9.3.1.1. Use of the Revisualised Bioecological Systems Model

The revisualised Bioecological Systems Model enabled the researcher to examine the ecosystem of students with blindness and low vision to identify:

a) Processes: the proximal processes interacted within the ecosystem, to produce the developmental goal under consideration (Ashiabi & O'Neal, 2015). Proximal processes positively impacted the person when they were present and negatively impacted the person if they were not present or interacted with frequently (Merçon-Vargas et al., 2020).
b) Person: the demand, resource, and force characteristics will impact how a person interacts with their environment. Knowledge of the person's characteristics were important to understand why students respond differently to the same opportunities (Bronfenbrenner & Morris, 2005).
c) Context: the stakeholders within the ecosystem were identified to select participants for the study for collection of empirical data, and support from within the context of the ecosystem can empower the student to develop personal agency.
d) Time:
    i. mesotime, or how often the person interacts with the processes,

ii. how the environment changed over time, such as changes in technology, as well as attitudes about disability within education and employment.

The revisualised Bioecological Systems model (Figure 3.4) was used in this study to identify each element of the ecosystem and identify barriers and enablers that impacted regular and sustained interactions with students with blindness and low vision in mainstream secondary schools.

The Revisualised Bioecological Systems Model is additionally proposed to be useful for practice, specifically for educators when undertaking individual planning sessions within schools. In Australia, for example, schools and teachers develop Individual Education Plans (IEPs) for students with disabilities. IEPs are written statements that describe the modifications for students to achieve success in their academic, social and personal needs. Typically IEPs outline:

a) students' individual skills and abilities (Person),
b) modifications required to access the curriculum (Proximal Processes),
c) stakeholders who provided support (Context), and
d) the period of time for which the processes would be implemented (Time).

The Bioecological Systems Model would be useful within IEP development, to include the perspectives of significant others within the ecosystem such as parents/carers, advisory teachers and therapists (Queensland Government, 2016b). Further, advisory teachers and other support staff within schools could use the Revisualised Bioecological Systems Model in a similar way to examine the ecosystem of students on their caseload or within the school to provide a more personalised approach to learning.

The revisualised Bioecological Systems Model has proved to be a highly conceptualised approach to identifying factors in the ecosystem which impact the developmental outcomes of students who are blind and have low vision in mainstream secondary schools. Identifying the barriers and enablers are important for educators to consider practices that may further support future employment. The low employment rate of people with blindness and low vision must be improved to afford personal and professional qualities that are at risk of not being utilised to enable students interact with future education, employment and inclusion within the community.

9.3.2. Knowledge to Improve Practice Within the Entire Ecosystem

This study has undertaken a unique approach in examining an holistic range of perspectives from stakeholders throughout the ecosystem of students with blindness and low vision in mainstream secondary schools. A crucial contribution of this study was identifying the proximal processes of disability-specific skills, as having a profound influence on the developmental outcomes. Recognising the proximal processes has afforded the identification of barriers and enablers within the ecosystem which are influenced by the person, their context, and interactions with proximal processes over time. From identifying barriers and/or enablers to participation in learning and future employability, several observations have been made to improve practice for students with blindness and low vision. These significant contributions align to Research Question 3; What are the implications of this knowledge, for future employability and practice, for educators?

9.3.2.1. Empower Students to Develop Personal Agency

This study supports prior research that students with blindness and low vision have diverse and unique access needs in education and employment. Using the revisualised Bioecological Systems Model, this research provided an holistic approach to understanding the barriers and enablers for the student. By contexualising the influence of personal characteristics and their interaction with the proximal processes, this study identified personal barriers and enablers for students with blindness and low vision within mainstream secondary schools. The findings showed students encountered normative age-specific challenges of being a teenager, along with emotional impacts from having a disability, which for some, created feelings of being different from their peers. The findings from this study confirm the work of McLinden et al. (2016); McLinden et al. (2020) who recognised that it was agentic for older students to be learning to access information independently, as opposed to having modifications provided by others. Participants also identified that it was an enabler when support was provided from a young age to teach knowledge about disability-specific skills. As students become more familiar with the disability-specific skills, expert and knowledgeable support within the ecosystem to empower students to make decisions about their access needs, enabled students to develop personal agency over their learning.

This study identified that confidence, independence, and decision-making skills that provide personal agency enabled students to interact with the disability-specific skills to participate in learning. Educators can support students to develop knowledge of the disability-specific skills and confidence to make access decisions independently. Which, in turn, will develop cognitive and intrapersonal skills, which are desired in future employment.

9.3.2.2. Encourage Use of Mainstream Technology for Access and Inclusion

This study revealed that the inbuilt accessibility features of mainstream technologies were the preferred methods for accessing curriculum materials in the classroom. Increased capabilities of technology over time, has enabled access to curriculum materials simultaneously as their peers. As an example for people with lived experience relied on braille that was printed out by support teachers. Whereas current electronic braille technology affords students who were braille readers, to gain immediate access to read and write, gain knowledge of punctuation, spelling and other literacy skills required in employment (D’Andrea et al., 2009; Doepel, 2015). Similarly students who use auditory or visual formats, can access digital materials to make modifications independently. Stakeholders supposed that cohesive use of assistive technology enabled students to interact more naturally with the curriculum and was less likely to be perceived as different from their peers, decreasing the social impact of blindness and low vision in their learning. A student also noted that mainstream technologies would assist in future employability, as assistive technology would be included in the devices that an employee would be expected to use.

The increased capabilities of in-built technologies in mainstream devices can enable students' access to the curriculum and the workplace in a socially inclusive way. Support from stakeholders in the ecosystem to empower students to build knowledge and engage with suitable accessibility features can increase access to learning. The use of assistive technology can also increase personal agency, which is a desired trait of employment.

9.3.2.3. A Collaborative Approach to Learning is Necessary

Data from interviews within this study confirmed that a collaborative approach to providing support for students with blindness or low vision is needed to promote positive developmental outcomes in mainstream secondary schools. While other studies have also noted the importance of clear communication to enhance student learning outcomes, this study has consolidated the importance of the holistic ecosystem for students with blindness and low vision. Findings showed support from staff within the school, external providers such as advisory teachers and therapists, alongside parents could influence access to the curriculum. When educators worked together to share knowledge and expertise, the ecosystem functioned positively, and students were provided with the best support in learning. Conversely, participants identified that when stakeholders were not involved in a collaborative process, the ecosystem may become dysfunctional, impacting students' potential for employment and post-schooling success.

This study has additionally found that by the time a student is in secondary, the student should have had a significant voice in the collaboration and communication between stakeholders. It is recommended that educators forefront the student when making decisions about learning. This agentic approach allows the student to take control of their accessibility and access needs and seek assistance from supportive systems. These skills will be required in future education and employment.

9.3.3. Contributions to the Knowledge of Future Employability

A further practical contribution from the study is in relation to the findings to answer Research Question 3: What are the implications of this knowledge, for future employability and practice, for educators?

The participants in this study highlighted the importance that all stakeholders have high expectations in terms of education and career goals for students with blindness and low vision, in line with their sighted peers. Within Australia, while blindness and low vision organisations work toward aligning employer attitudes toward hiring people with blindness and low vision with disability legislation (Vision Australia, 2021a, 2021b), responsibility for education systems to prepare students for the workforce has been increasingly recognised as a national focus (Australian Government, 2019). Goals for transition to employment included preparing students with future employability skills and encouraging vocational learning pathways to prepare for work (Australian Government, 2021). Future employability skills included cognitive, interpersonal, and intrapersonal skills to be prepared for the workforce (Warner et al., 2020). These skills were implicit in the learning areas and general capabilities of the Australian Curriculum.

This contribution to knowledge identifies the known links between the Australian Curriculum and the career readiness skills required for future employability. However, due to the unique access needs for students with blindness and low vision, additional disability-specific skills are required to access the visual content of the curriculum. This knowledge is important, as without access students with blindness and low vision will not be able to engage in the academic, personal, and social skills embedded in the content of the Australian Curriculum. Therefore to fully access the academic curriculum and future employability, educators need to prioritise the disability-specific skills to ensure equitable opportunities in the workforce.

9.3.3.1. Formalising Scope and Sequence of Disability-Specific Skills for Employability

The empirical findings from this study found that explicit teaching of disability-specific skills was important for students with blindness and low vision for transition to employment. Students with vision within mainstream schools learned many skills incidentally, such as orientation and mobility, and could see facial expressions for social interactions. Students with blindness and low vision required modifications, such as the use of assistive technology and/or braille, to access curriculum and workplace materials. This study highlighted that there was not enough time to focus on these disability-specific skills for students with blindness and low vision in mainstream schools, as the priority was on access to the academic curriculum. It was proposed that the explicit teaching of disability-specific skills in mainstream schools is required to transition to higher education and employment.

As a product of this research, a scope and sequence for disability-specific skills has been compiled and formalised as accredited Vocational Education and Training certificates (Appendix E). Students could take such certificates to earn credit points towards their secondary schooling, meaning that the disability-specific skills required by students with blindness and low vision in employment could be undertaken within allocated class time.

Significant contributions from this study were presented, which included the revisualisation of Bronfenbrenner’s Bioecological Systems model, several evocations for educators related to the improved practice, and contributions to the knowledge of future employability. Recommendations will now be presented, which have arisen from this study.

9.4. Recommendations Arising From This Study

This study focused on the experiences of students with blindness and low vision to understand barriers and enablers in mainstream secondary schools in relation to participation in learning and transition to employment. The significant contributions to knowledge and practice have led to the following four recommendations:

a) Recognise that students with blindness and low vision are a diverse group with individual needs
b) Promote technology for independent access to learning
c) Improve collaboration and communication within the entire ecosystem, and
d) Formalise the scope and sequence of disability-specific skills for employability.

9.4.1. Recommendation 1: Recognise That Students With Blindness and Low Vision Are a Diverse Group With Individual Needs

Through the lens of many stakeholders, this study has highlighted that students with blindness and low vision have unique and individual needs that are influenced by their characteristics and factors throughout their ecosystem. The individual ecosystems need to be understood to best meet the needs of the students in their educational context and prepare for future employment. It is recommended that the revisualised Bioecological Systems Model () be used to assist in IEP and career planning for students with blindness and low vision, to ensure students' abilities and goals are identified. Processes can be implemented to prepare for the transition to further education and/or employment.

9.4.2. Recommendation 2: Promote Technology for Independent Access to Learning

The findings of this study indicated that technology was an important enabler for students with blindness and low vision to access curriculum materials independently. Technology has the potential to enable students to independently access files required for social participation, education or employment in a digital format, at the same time as their peers. Therefore, it is recommended that relevant education systems adequately resource students with equitable access to appropriate technologies that allow access to learning. Where possible, students should use mainstream devices, such as laptops and tablets, to enhance inclusion within mainstream secondary schools and as preparation for the workforce. Technology needs to be supported within the system, and students and teachers trained in the effective use and maintenance of devices.

9.4.3. Recommendation 3: Improve Collaboration and Communication Within the Entire Ecosystem to Promote Learning

When examining the holistic ecosystem for students with blindness and low vision, it was recognised that differences in the students' contexts impacted the students' opportunity to access learning. Students in rural areas had fewer opportunities to access trained and experienced advisory teachers. Communication between stakeholders and high expectations were considered enablers to students accessing learning. Therefore it is recommended that school teams work collaboratively with students, families, and advisory teachers/therapists to ensure access to the school curriculum and external opportunities that may arise for students to participate.

For a collaborative approach to be most efficient, attitudes from all stakeholders with high expectations were essential to ensure students were provided with opportunities to participate in education and preparation for the workforce. Classroom teachers and school staff need regular and ongoing professional development and training from and for expert advisory teachers and therapists. Additionally, it is recommended that learnings from increased exposure to online videoconferencing through Zoom during the Covid-19 pandemic be implemented to consider alternate methods to access professional development and advisory teachers/therapists in rural and remote areas.

9.4.4. Recommendation 4: Increase Focus of, and Support for, Employability

An increased focus on implementing disability-specific skills for students with blindness and low vision, will support students with blindness and low vision to access the academic curriculum and prepare for the transition to employment. Vocational Education and Training Certificates that focus on the disability-specific skills required by students with blindness and low vision have been accredited by the Australian Skills Quality Authority.

Accredited Vocational Education and Training certificates offer students the opportunity to earn credit points towards their secondary school certificate and Australian Tertiary Admission Rank. Courses such as these could provide students with blindness and low vision, the necessary skills to access education and prepare for the transition to employment. It is recommended that students enrol in these Vocational Education and Training certificates to learn the disability-specific skills to gain agency in learning and prepare for future education and employment.

This study led to four recommendations promoting participation in learning for students with blindness and low vision in mainstream secondary schools and developing students' future employability skills. The limitations of this study will now be addressed.

9.5. Limitations of This Study

There are several limitations of this study that have been identified in this study. The first is related to the method for sampling and recruiting students. This study acknowledges a small sample size. To increase validity, sample selection was grounded in the literature and specifically designed to include the diversity of students' vision loss, cultural background, and geographical location. However, due to selecting a sample size that was both representative and could be managed within the scope of this study, rich empirical data was obtained from interviews from a sample of six students with blindness and low vision and 30 stakeholders within their ecosystem. The students interviewed within this study all reported having suitable access and support to education. However, it is known that this is not the case for all students. As each student possessed unique characteristics and contexts, this meant data from this group of students could not be assumed to be transferred to another individual student with different personal characteristics and contextual environments. The revisualised Bioecological Systems Model offers the potential for others to check the generalisation of this research in their own context.

The second limitation stemmed from data being taken for one group of students at a unique time. The data from this study was collected in 2020 and 2021. The students were in secondary education at the time. The students were located in a State which was relatively free from extended lockdowns due to the COVID-19 pandemic. However, students' access to resources, support, and services may have been temporarily altered. Further, it would be suggested that the educational staff, policy-makers, employers, and people with lived experience be involved in different states or internationally, given the issues they face may differ from one location to the next. It is unknown if students with blindness and low vision in other countries face similar constraints or have greater access to support systems in terms of developing skills for employment once they finish school.

9.6. Conclusion

This study explored barriers and enablers for students with blindness and low vision in Australian mainstream secondary schools, in relation to participate in learning and develop skills for future employability. The aim was to understand the low employment rate that continues to exist for people with blindness and low vision. Using a Bioecological Systems Model (Bronfenbrenner & Morris, 2005) this study used qualitative interviews to listen to the voices of the stakeholders within the ecosystem.

Students with blindness and low vision have unique access issues which provide barriers to accessing the Australian Curriculum. Access to the curriculum is important, as it has been rigorously designed to teach students the cognitive skills required in secondary, along with personal and social capabilities required to interact with others. These three skills have been identified as career readiness skills, meaning that participation in learning in secondary is preparing students for the future workforce.

This study uncovered that students with blindness and low vision required explicit teaching of disability-specific skills to access work independently. Disability-specific skills were recognised as proximal processes in the students' ecosystem. When students engaged with proximal processes regularly and over sustained periods of time, they had a profound impact on the person. The study revealed individual characteristics additionally influenced the effectiveness of the proximal processes. When students were able to confidently make decisions and use these skills to access learning, they acted as an enabler to learning, and future employability. Further, a collaborative system of support to empower students to develop knowledge of disability-specific skills helped students to develop agency over their learning and future employment.

This study made a number of contributions to research and practice. First, a Bioecological Systems Model was revisualised. This model operationalised selection of participants, and structured the discussion. The revisualised model can be replicated to guide holistic research for students within schools, or larger groups of students with disability, both within Australia and internationally. Several evocations were made, regarding improvement of practice for educators, such as a focus on developing personal agency, use of mainstream technology to foster academic and social inclusion, and the importance of collaboration and communication to support students within mainstream secondary schools.

Further, this study has shown that it is possible to provide the foundation for nation specific accreditation of secondary courses aiming to develop the disability-specific skills blind and low vision students may need for future employment. This is important, as all students want to feel confident about future employment prospects. Such Vocational Education and Training Certificates could contribute towards their senior certificate and provided skills for their future workplace. Given there is a lack of a national curriculum currently in Australia, such certifications could contribute significantly to international research in preparing students with blindness and low vision for transition to employment. It is suggested further longitudinal research be undertaken to examine the effectiveness of the disability-specific skills on students with blindness and low vision in mainstream secondary schools and preparation for employment.

This study has shown that when students with blindness and low vision have access to participate in learning in mainstream secondary schools, they are preparing for employment. Alongside the Australian Curriculum, students with blindness and low vision need regular and sustained interactions with the disability-specific skills to develop agency to take control of their own learning. It has also been identified that many personal characteristics and contextual factors influence access to disability-specific skills. It is encouraging to believe that this study revealed that these proximal processes might be the key to unlocking future employment for people with blindness and low vision. The findings suggested that current people in the workforce were not explicitly taught how to use assistive technology and other aspects of the disability-specific skills from a young age. The students interviewed felt confident in their ability to make modifications independently. Hopefully, this generation will be the ones to change the employment statistics.

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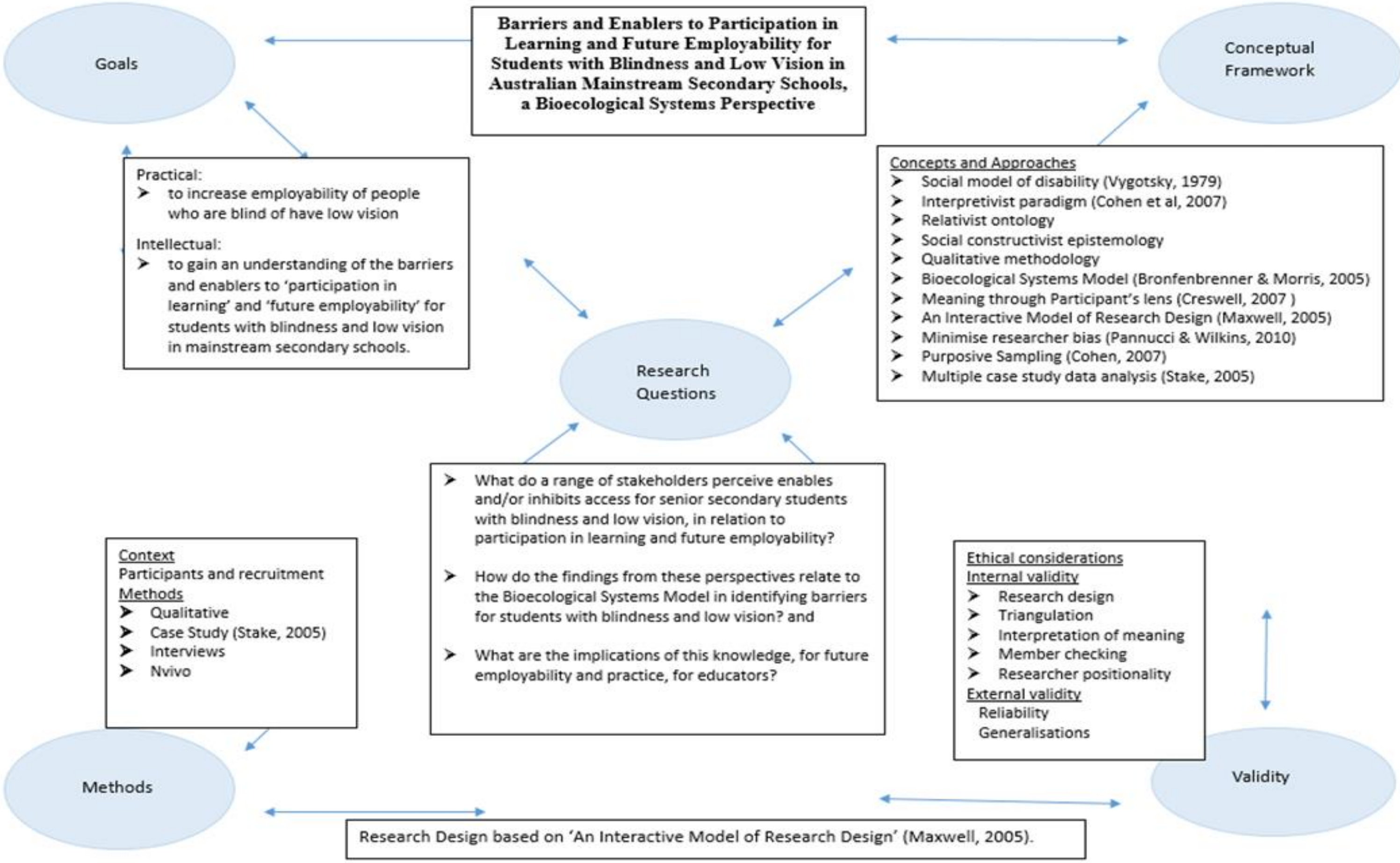
Appendices

Please contact the author for original documents if using a screen reader

Appendix A Research Design



Appendix B NVivo tentative nodes and themes

Students	Microsystem		Mesosystem	Exosystem	Macrosystem	
Students	Parents	Teachers	Advisory Teachers/Therapist	Policy makers	Lived experience	Employment consultant/ Employers
Systems						
Feelings of inclusion	Choosing mainstream schools				Inclusion – incidental information	
Modification of materials	modifications	modifications	modifications		modifications	Modifications - independence
	Subject accessibility	Subject selections		Specific subjects	Subject accessibility	
Exams		Exams		Exams		
Participation – extra curricula					Participation – extra curricula	Participation – extra curricula
Support in school	Access to Expert knowledge in schools	Expert Knowledge in schools	Expert knowledge		Teacher support, external agencies	
Teacher pedagogy		Teaching pedagogy	Teaching pedagogy(expectations independence participation)	Teacher pedagogy		Expectations
School environment	School environment (layout and culture)					
		Support within school	Access to trained and AT – qualified,	Access to advisory teachers qualified		
		Resources		Resources		
		Implementation of disability specific skills	Expanded core curriculum	Compensatory skills		
				Visible disability		
		Professional development				
Time		Time	Caseload & staffing	Caseloads of AT & TIme		

	Location of school		Rural and remote	Rural and remote recruitment		Regional and remote
		Use of teacher aides		Use of teacher aides		
Technology						
Types of technology	Types of technology			Availability & knowledge of types		Types of technology
	Tech did not work, or cost	Access	Access	Access		
competency	Needing to provide support	Training	Training	Training and skills	competency	Capability
		Braille		Braille		Braille
Assist with employment				Preparedness for transition – independence and	Needed for employment	Employment preparation
					Being seen as different	
Individual						
Self advocacy						
	Type of learner	Student as individual	Individual traits – confidence, and independence			
		Family support	Family support		Family support	
Emotional impact	Emotional		Mental well being	Emotional impact	Perceptions of self	
	Level of vision	Level of vision		Level of vision	Losing vision	
	Social		Social networks	Social skills	Social interaction, social skills	Social interaction
				Being a teenager	Being a teenager/ different	
O&M	O&M			Independent		O&M

Appendix C NVivo Data Findings by Case Study and Theme

Name	Files	References
Data findings for single case studies	36	968
Case study 7 Employers	4	18
What do you look for	4	10
What do you want to know	4	8
Case study 6 People with lived experience	4	93
Student support systems	4	27
Access to curriculum materials	4	44
Inclusion within the school context	4	22
Case study 5 Parents	6	197
Modifications and support in schools	6	60
Student' individual characteristics	6	47
Employment	6	56
Access to Technology	6	34
Case study 4 Policy Makers	4	118
Preparedness for transition	4	51
Partnerships and resources to support students in schools	4	52
Impact of Blindness and low vision on learning	4	15
Case study 3 Advisory teachers and therapists	6	181
Student support systems	6	98
Preparation Post-school	5	39
Attitudes towards blindness and low vision	6	44
Case study 2 Teaching Staff	6	103
Modifications within the school system	6	37
Knowledge and understanding	6	30
Individual	5	21
Future Employability	4	15
Case study 1 Students	6	258
Technology	6	84
Employment	6	58
Access to the curriculum	6	116

Appendix D NVivo Multiple Case Study Analysis

Codes

Search Project

Name	Files	References
Discussion	36	968
Discussion Theme 1 Individual student needs	25	112
Characteristics 1 Demand	4	8
Characteristics 2 Resource	14	20
Characteristics 3 Force	21	82
Discussion Theme 2 Inclusion	30	340
Barriers to access curriculum materials	25	86
Inclusive culture and attitudes	6	15
Modifications to access work	12	59
Use of technology	25	176
Discussion Theme 3 Support Systems	27	309
a Support and communication as a system	11	13
b Microsystem	26	274
Family	12	32
Peers	16	44
School systems	16	71
Teaching staff	22	127
c Mesosystem	3	4
Advisory teachers therapists impact in school	3	4
d Mesosystem	7	15
Access to specialist teachers	6	10
Discussion Theme 4 Disability specific skills	21	83
Expanded core curriculum	16	67
Gap in concept development	3	6
Life skills	2	4
time	3	4
Discussion Theme 5 Preparation for employment	21	124
Employment after school (Lived experience)	4	7
Participation	2	3
Skills to Prepare for employment	11	75
Technology	4	15
What employers look for	4	17

Appendix E Research Design, Showing Relationship of Research Questions to Findings

Research Problem: Despite change in legislation, employers' attitudes toward disability, and increased technology, only 24% people with blindness and low vision are in full time employment (Vision Australia, 2018)

Three Research Questions:

- What do a range of stakeholders perceive enables and/or inhibits access for senior secondary students with blindness and low vision, in relation to participation in learning and future employability?
- How do the findings from these perspectives relate to the Bioecological Systems Model in identifying barriers for students with blindness and low vision?
- What are the implications of this knowledge for future employability and practice for educators?

Literature (Chapter 2)	**Theoretical & methodological concepts** (Chapter 3 & 4)	**Participants** (Chapter 4)
Education of students with blindness and low vision Enablers and barriers to education Enablers and barriers to employment	Theoretical Framework • Bioecological System Model (Bronfenbrenner & Morris, 1998)	**Student's perspectives** • Students with blindness and low vision in mainstream senior secondary education (n=6)
	Researcher's lens • Interpretivist paradigm • Relativist ontology • Social constructivist epistemology	**Education stakeholder's perspectives** • Teaching staff: classroom teachers (n=2); support teachers (n=3), teachers' aide (n=1) • Advisory teachers (n=4), therapists (n=2) • Policy makers (n=4)
	Methods • Qualitative methodology • Multiple case study data analysis (Stake, 2005) • Meaning through Participant's lens (Creswell, 2013)	**Additional stakeholder's perspectives** • Parents of students with blindness and low vision (n=6) • People with lived experience of blindness and low vision (n=4) • Disability employment consultant (n=1) Employers (n-3)

Key Findings from stakeholders' perspectives:

Chapter 5	• Access to learning • Knowledge and use of assistive technology • Preparedness for employment
Chapter 6	• Access to learning • Understanding the individual students' needs • Building knowledge of student support systems • Preparedness for future employment
Chapter 7	• Access to learning • Students individual characteristics • The importance of support systems • Preparedness for future employment

Discussion of main themes (Chapter 8)

PERSON: The influence of individual characteristics
PROXIMAL PROCESSES: Impact on participation in learning and future employability
CONTEXT: Support within the ecosystem
TIME: Influence of chronosystem on proximal processes

Contributions to conceptual knowledge (Chapter 9)

Revisualisation of the Bioecological Systems Model
Knowledge to improve practice within the ecosystem (agency, mainstream technology, collaboration)
Contributions to future employability (scope and sequence for disability-specific skills)

Appendix F Notification of Initial Accreditation of the Expanded Core Curriculum in Mainstream Senior Secondary Schools

Australian Government
Australian Skills Quality Authority

ASQA

23 August 2021

Ms Melissa Fanshawe
Representative
Vision Australia Limited
454 Glenferrie Road
KOOYONG VIC 3144

Course owner number – CO10437

By email to: Melissa.Fanshawe@usq.edu.au

File No: I471

Dear Ms Fanshawe

Application for initial accreditation - granted

I refer to your application to have the course Certificate I in Access Technology accredited by the National Vocational Education and Training Regulator (the Regulator). The Regulator is the person appointed to make decisions under the *National Vocational Education and Training Regulator Act 2011 (NVR Act)*, and works as a part of the Australian Skills Quality Authority (ASQA). ASQA's work supports the Regulator in their decision-making.

In accordance with the provisions of the *National Vocational Education and Training Regulator Act 2011* (NVR Act), your application was granted on 23 August 2021.

The code and title of the accredited course is:

10981NAT	Certificate I in Access Technology

The code and title of the units of competency are

NAT10981001	Getting started in the workspace
NAT10981002	Use technology tools to access printed information
NAT10981003	Use tactile tools to access objects and printed information in the workspace
NAT10981004	Manage self in the workspace
NAT10981005	Use audio tools to access printed information
NAT10981006	Use technology tools for written communication in the workspace

ABN 72 581 678 650
GPO Box 9928, Melbourne VIC 3001

InfoLine 1300 701 801
www.asqa.gov.au

Australian Government

Australian Skills Quality Authority

ASQA

30 August 2021

Ms Melissa Fanshawe
Representative
Vision Australia Limited
454 Glenferrie Road
KOOYONG VIC 3144

Course owner number – CO10437

By email to: Melissa.Fanshawe@usq.edu.au

File No: I477

Dear Ms Fanshawe

Application for initial accreditation - granted

I refer to your application to have the course Certificate II in Access Technology accredited by the National Vocational Education and Training Regulator (the Regulator). The Regulator is the person appointed to make decisions under the *National Vocational Education and Training Regulator Act 2011 (NVR Act)*, and works as a part of the Australian Skills Quality Authority (ASQA). ASQA's work supports the Regulator in their decision-making.

In accordance with the provisions of the *National Vocational Education and Training Regulator Act 2011* (NVR Act), your application was granted on 30 August 2021.

The code and title of the accredited course is:

10986NAT	Certificate II in Access Technology

The code and title of the units of competency are

NAT10986001	Travel independently to and from the workspace
NAT10986002	Access visual information provided in images, graphs, diagrams, tables and forms
NAT10986003	Use braille in the workspace
NAT10986004	Access workspace information and documents
NAT10986005	Maintain personal health and safety in work-related activities
NAT10986006	Use screen reader technology