School of Occupational Therapy
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Predictors of Successful Inclusion for Children with Vision Impairment in Early Education

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DECLARATION

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgement has been made.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

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ABSTRACT

The international movement to include children with disabilities in education has resulted in significant legislative and policy change. However some have argued that this has not translated into actual practice and that inclusion (as opposed to integration) is not the usual practice in Australia. There are fears that inclusion, if implemented poorly, will be detrimental to the wellbeing of students with disabilities. Similar concerns exist for students with vision impairment. The quality of their inclusive experiences varies dramatically from school to school, with an isolated few children reaping the expected benefits of inclusion. The variation in these experiences has not yet been explained.

The purpose of this research was to determine which, if any, factors predict successful inclusion for children with vision impairment in regular early education in Australia. The research occurred in two phases: (1) a formative, qualitative phase; and (2) a quantitative, longitudinal phase.

The aim of Phase 1 was to select factors that stakeholders perceived were important in influencing the inclusive early education of children with vision impairment in Australia. Nominal Group Technique elicited the perception of five stakeholder groups (allied health professionals, visiting teachers, classroom teachers, parents of, and students with vision impairment) (N = 25). The ranked items generated by each stakeholder group were combined using content analysis. These were then ranked overall. The top-ten ranked 'stakeholder factors' formed the independent variables for the second phase of the study.

Phase 2 had three aims relating to regular early education in Australia: (1) to describe the situation that children with vision impairment are exposed to (i.e. the stakeholder factors identified in Phase 1); (2) to compare the inclusive outcomes (participation, engagement, child interaction, academic and overall) of children with and without vision impairment; and (3) to determine the influence of the stakeholder factors on the inclusive outcomes of children with vision impairment. A prospective, longitudinal cohort design was used; conducted over two years. Twenty children with vision impairment and 37 sighted classmates (mean age 65 months) who attended regular kindergarten to grade one classes in Australia participated.

Three aspects were commonly found to be poor in the regular class situations: access to vision aides and equipment, support for staff, and teacher training and experience; however the individualisation and physical environment were adequate. Non-parametric analysis demonstrated that both education staff and parents were more involved with children with vision impairment compared to classmates. The children's social skills differed only at the end of the second year.

Children with vision impairment had significantly poorer inclusive outcomes than classmates. Mann-Whitney *U* Tests found that children with vision impairment participated significantly less in class activities, were less engaged in tasks and experienced poorer social interaction than classmates at each point during the two years. At the end of the second year, children with vision impairment had significantly poorer academic performance.

A three-step process selected the stakeholder factors that had a significant individual influence on the inclusion of children with vision impairment, relative to their classmates. Receiver Operating Characteristic curve analysis then demonstrated that Indices of these combined stakeholder factors predicted successful inclusive outcomes of children with vision impairment up to two years later. Presence of a combination of at least six factors, categorised as Environmental (teacher attitude, teacher training and experience, adult involvement, vision aides and equipment and physical environment); Personal (early intervention); and/or Activity Performance (social skills) significantly improved the likelihood of success.

This study demonstrated that a high proportion of children with vision impairment in Australia are exposed to less than adequate situations in early education, and, as such, experience poor quality inclusion. Given the long term effects of early experiences, it is imperative that children have positive early education experiences. This research provided new knowledge of the factors that *can* improve regular early educational outcomes for students with vision impairment. This can further guide the decisions of policy makers, educators, health professionals and parents concerned with improving the life of children with vision impairment.

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GLOSSARY

Adequate situation: an educational situation referring to a factor at a good level.

Academic performance: performance in typical grade expectations, including reading, writing and mathematics.

Blindness: best corrected acuity in the better eye less than 3/60 metres (World Health Organization [WHO], 2006)

Cluster: a student with vision impairment and their respective classmates.

Child interaction: social interaction with peers.

Early education: education level from two years prior to Grade 1 to Grade 1.

Education assistant: paraprofessional who, under the direction of the classroom teacher, supports the student with a disability, and other students in the class.

Engagement: being appropriately involved, either actively (performing) or passively (attending to, listening), in meaningful activity; not waiting, disengaged or misbehaving (Wolery, Pauca, Sigalove Brashers, & Grant, 2000).

Grade 1: The first year of compulsory schooling for children in Western Australia and Queensland and compulsory to attend full time in all Australian states. Children start at the start of the year they turn six (Department of Education and Training Western Australia [DET WA], 2007).

Index (outcome): number of combined individual factors present at Time 1.

Individual factor: a stakeholder factor that significantly influences an inclusive outcome after one or two years.

Integration: relates primarily to physical placement in a regular class. Students with disabilities are educated for some or all of the day in regular programs, generally not at a local school, as specialist teachers and supports are often available at specified locations (Elkins, 2002)

Inclusion: the provision of education programs in local settings that are designed to be appropriate for *all* students in physical, curricular and social terms (Elkins, 2002).

Kindergarten: education level two years before to Grade 1. Referred to as Kindergarten in Western Australia and Queensland; and referred to as Preschool in Victoria. Children start at the start of the year they turn four and attend for up to 12 hours per week (DET WA, 2007). Attendance is not compulsory.

Least restrictive environment: a setting that challenges the developmental, social and learning needs (without causing undue grievance) to the individual child.

Legal blindness: a term constructed for welfare benefits, referring to corrected acuity worse than 6/60 metres, or visual field loss of more than 10 degrees (Davidson & Harrison, 1997). Some blind individuals have light perception or no light perception at all.

Low vision: a best corrected visual acuity in the better eye of less than 6/18 metres and no more than 3/60 metres or visual fields less than 20 degrees in diameter (WHO, 2006). From a service perspective, it refers people who use, or are potentially able to use, vision for the planning and/or execution of a task for which vision is essential (WHO, 2005a).

Moderate visual impairment: less than 6/18 to 6/60 best corrected visual acuity in the better eye and/or visual field less than 20 to 10 degrees.

Participation: assigned to and/or involved in a class activity, or the same activity as at least one peer (Wolery et al., 2000).

Pre-primary: education level one year before Grade 1. Children can start full-time education. Referred to as Pre-primary in Western Australia, Preschool in Queensland and Preparatory in Victoria. Children start at the start of the year they turn five. Attendance is compulsory only in Victoria after the sixth birthday (DET WA, 2007).

Preschool: in the literature review, this refers to any education level before Grade 1.

Primary school: education Grades 1 to Grades 6 or 7, depending on Australian state.

Regular education/school: a typical, local education setting that enrols all children with and without disabilities. This term replaces the use of the term 'mainstream' to avoid connotations associated with integration and to focus on inclusion.

Special school: a separate school that enrols only children with disabilities.

Special/ised education: an education setting for students with disabilities that is not a regular, mainstream class; including Education Support Unit (separate class for children with disabilities within a regular school); Education Support Centre (separate centre at a regular school) or Education Support School (Special School).

Stakeholder factor: one of ten factors generated by stakeholders in phase one of this study, that is measured as an independent variable in the second phase.

Success/ful: *good* level of inclusive outcomes (participation in classroom activities; engagement in purposeful activity; child interaction and/or academic performance).

Severe visual impairment: less than 6/60 best corrected visual acuity in the better eye and/or visual field less than 10 degrees (Gilbert & Foster, 2001).

Total blindness: no light perception and a complete lack of visual form (Gale & Cronin, 1998)

Vision impairment: impairment of vision ranging from low vision to total blindness (Davidson & Harrison, 1997) that is severe enough to impede performance of vocational, recreational and/or social tasks, which cannot be corrected to normal vision by regular eyeglasses or spectacles (Association for the Blind of WA, 2004).

Visiting teacher: a specialised, itinerant teacher who provides educational services and support to children with vision impairment, their classroom teachers and schools.

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Inclusive education represents a significant change to education. The intense international focus on inclusion has resulted in major overhauls of Australian legislation and policy; however, philosophical dilemmas persist. It is argued that inclusion is still not the usual practice in Australia (Wills & Jackson, 2000b). The rapid increase in the number of students with disabilities attending regular schools has been largely unmatched by adequate support, resources and curricular provisions (Crosby, 2002; Norman, Caseau, & Stefanich, 1998). As such, fear that inclusion will lead to increased segregation and dependence of students with disabilities is rife (J. O'Neil, 1994; Sutherland, 2001).

Internationally, the practice of placing children with vision impairment in regular education outdates inclusive policy by 75 years (Bishop, 1986). Despite this, the quality of their inclusive experiences continues to vary dramatically from school to school. Potentially few children with vision impairment reap the benefits of inclusion (Gale & Cronin, 1998; Leigh & Barclay, 2000; McGaha & Farran, 2001; Royal Blind Society, 1996). This variation in inclusion has not yet been explained.

In spite of the critical concerns surrounding the inclusion of children with vision impairment, research is scarce. Beyond stakeholder speculation and qualitative research, there is limited evidence on which to base informed decisions about student preparation for, and inclusion in regular education settings. The following information is unknown: (1) the circumstances under which these children are educated, (2) the adequacy of their inclusion, and (3) the factors that promote their optimal inclusion (Erwin, 1991; Lindsay, 2007). This information has the potential to guide strategies that will promote the immediate and future well-being of students with vision impairment. This study investigates these three aspects of inclusion of children with vision impairment, and provides critical guiding evidence.

1.2 MAGNITUDE OF THE PROBLEM

The emotional, social and economic costs of vision impairment are life-long and far reaching. It impacts on the child, their family, and society. Despite the low prevalence of childhood vision impairment (constituting approximately 4.2 million of the 180 million world wide vision impaired population) the enduring costs mean that the global impact almost equals that of the major cause of vision impairment in adults (Gilbert & Foster, 2001; Thulasiraj & Muralikrishnan, 2001; WHO, 1999). Up to 75% of the disorders that cause childhood vision impairment in developed countries are neither treatable, nor potentially preventable with current knowledge (Rahi & Cable, 2003). While medical advances into the prevention and treatment of these disorders are critical, it is equally important to promote the quality of life of children who currently have vision impairment.

The impact of vision impairment persists through the lifespan. Vision impairment is associated with developmental, social and emotional difficulties in children (Beaty, 1991; Dale & Sonksen, 2002). It is linked with increased social dependence (H. R. Taylor, Pezzullo, & Keeffe, 2006), depression, and reduce quality of life among adults (Rovner, 1998). From an economic perspective, blindness in children causes about one third of the total global economic cost of blindness (WHO, 2005b). Adults with vision impairment are less likely than the general population to be employed (Leonard, D'Allura, & Horowitz, 1999; McCarty, Burgess, & Keeffe, 1999). Their lost earnings cost the Australian economy nearly $1.8 billion in 2004; contributing to the total $9.85 billion national cost of vision disorders (H. R. Taylor et al., 2006).

The aging population and decreasing birth rate mean that in coming years all available skills, including those of individuals with disabilities, will be needed to maintain existing developed economies (Organization for Economic Cooperation and Development [OECD], 2005). More than ever, it is critical for educational programs to prepare students with disabilities to achieve their potential and become participating citizens (OECD, 2005). This is particularly imperative for children with vision impairment given the pervasive difficulties they face throughout their lifetime. However, to do so, education programs must firstly learn *how* to influence the potential of these students. This research provides such information.

Children with vision impairment face barriers to successful performance in education. It is accepted that 80% of learning is visual (Pagliano, 2002; Palmer, 2000b). As such, concepts that are encountered incidentally by sighted children through visual observation are limited for children with vision impairment (Pagliano, 2002). Added to this, they have a range of specialised academic needs (Blatch, Nagel, & Cruickshank, 1998). Children with vision impairment are also at a distinct disadvantage in interactions with classmates. Many interaction skills are profoundly affected when vision is impaired; important nonverbal cues may be missed (Troster & Brambring, 1992); or the child may appear or behave in ways that decrease effective interaction with peers (Erwin, Alimaras, & Price, 1999; Read, 1989). The barriers faced in achieving successful outcomes in education are evident. Current evidence has described a wide variation in educational outcomes, but has not confirmed how children with vision impairment are performing in regular education.

Further to the educational risks imposed by impaired vision itself, inadequate educational practices place children with vision impairment at risk of exclusion in regular classrooms. Reports of students with disabilities experiencing less than adequate inclusion in Australian schools are alarmingly common. Isolation from peers and exclusion from class activities described in some cases (Kemp & Carter, 2002; Llewellyn, Thompson, & Fante, 2002; Sutherland, 2001; Wills & Jackson, 2000b). Most teachers have no experience with students with vision impairment, and many are reluctant to teach them (Wall, 2002). From the outset, children with vision impairment face barriers to achieving successful inclusion. This is unacceptable, since children who experience inadequate inclusion may be at risk of long term social and academic difficulties.

In particular, *early* educational experiences have strong long term consequences; effecting school adjustment, wellbeing and even employment outcomes. Inclusion in school activities has been associated with better quality of life (Simeonsson, Carlson, Huntington, Sturtz McMillen, & Lytle Brent, 2001) and reduced behaviour problems among students with disabilities (Reschly & Christenson, 2006; M. F. Sinclair & Christenson, 1998). Inclusion has the potential to build a sense of acceptance and belonging among students. Social inclusion as early as kindergarten has been associated with future social outcomes (R. O'Neil, Welsh, Parke, Wang, & Strand, 1997). Early social, academic and engagement experiences have been linked to academic outcomes up to eight years later in typically developing populations (DeRosier, Kupersmidt, & Patterson, 1994; Ferguson, Jimerson, & Dalton, 2001; Ladd, Kochenderfer, & Coleman, 1997; R. O'Neil et al., 1997). Finally, higher levels of education promote the attainment of competitive and higher level employment for people with vision impairment (Capella-McDonnall, 2005; Leonard et al., 1999). The adequacy of early experiences has long lasting effects on future wellbeing. However, existing research has not determined the adequacy of these experiences for children with vision impairment, nor has it explained the variation in inclusion among students. It is essential to determine how early inclusive experiences can be enhanced, to ensure that early education has a beneficial, rather than detrimental effect on the lives of children with vision impairment.

1.3 PRINCIPLE AIMS

This study investigated the inclusion of children with vision impairment in regular, early education in Australia. There were three principle aims:

1. to describe the situation that children with vision impairment are exposed to in regular early education;
2. to determine the inclusive outcomes (participation, engagement, child interaction, academic and overall) of children with vision impairment in regular early education compared to children without vision impairment; and
3. to determine the influence of stakeholder identified factors (see below) on the inclusive outcomes of children with vision impairment in regular early education.

In order to investigate factors that were relevant to the contemporary Australian context, a formative phase was conducted. This purpose of the formative phase was to select factors and inform the main study. The aim was:

- to select factors that stakeholders perceive are most important in influencing the inclusive outcomes of children with vision impairment in regular early education in the current Australian context.

1.4 SIGNIFICANCE OF THE STUDY

Although inclusive education is a contentious topic, little is known about the actual level of inclusion experienced by children with vision impairment. The global impact of childhood vision impairment and the long lasting effects of early educational experiences highlight the need to be aware of, and to promote their inclusion in early education. This study provides critical information for policy makers, principals, classroom teachers, specialists and parents of children with vision impairment. It identifies the need for improvement in inclusive education. Importantly, it determines the areas that can be modified to improve inclusive outcomes. This information provides: (1) guidance to implement positive change in regular education settings, (2) recommendations for early intervention, and (3) guidelines for the preparation of children with vision impairment for early education. These strategies can promote the success and future wellbeing of children with vision impairment.

1.5 STRUCTURE OF THESIS

This chapter has highlighted the magnitude of childhood vision impairment and the significance of this study. Chapter 2 reviews the literature about inclusive education. While it addresses international literature about typically developing children and those with disabilities, it has a particular focus on students with vision impairment and the Australian context.

The formative phase of the study (Phase 1) is presented in chapter 3: Generation of Stakeholder Identified Factors. The chapter reports the Phase 1 methods and results. The stakeholder factors are identified and discussed. This phase informs the main phase of the study.

The main phase of the study (Phase 2) is presented in chapters 4 to 6. The Phase 2 methods are described in chapter 4. The results are reported in chapter 5 and chapter 6 discusses the findings and their implications for practice. Finally, chapter 7 describes the strengths and limitations of the study. Recommendations are then made for policy makers, principals, accreditation bodies, educators, specialists and parents.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter provides a critical review of literature about inclusive education and students with vision impairment. It begins with a description of the characteristics of childhood vision impairment. A brief history of the inclusion movement is then presented; followed by a critique of the effectiveness of inclusion. Next, inclusive outcomes are defined; namely, the four outcomes used in this study (participation, engagement, child interaction and academic performance). The inclusive outcomes experienced by students with vision impairment in regular educational settings are then reviewed. Using a guiding framework, the situation that students experience in regular classes is described, and the current knowledge about the factors that effect inclusive success is reviewed. Finally, the methodological issues that impact childhood vision impairment research are reviewed.

2.2 CHARACTERISTICS OF CHILDHOOD VISION IMPAIRMENT

Vision impairment describes vision that is severe enough to impede performance of vocational, recreational, or social tasks and cannot be corrected to normal vision by standard refractive means. Children with vision impairment are considered to constitute between 0.07% to 0.22% of the total school population in developed countries (Best & Corn, 1993; Gardner, Morse, Tulloch, & Trief, 1996; Gilbert, Anderton, Dandona, & Foster, 1999; Rogers, 1996). In 2004 it was estimated that 5,700 Australian children aged under 15 years had complete or partial blindness (the criteria being totally blind in one or both eyes or partially blind in both eyes) (Australian Bureau of Statistics [ABS], 2006). The visual, developmental and functional characteristics of these children differ considerably.

Vision impairment includes vision ranging from low vision to total blindness, categorised from mild to severe (Table 2.1). Moderate impairment through to total blindness is the focus of this study. The majority of children with vision impairment have some residual vision. Approximately 80% have vision that can be used in daily activities, and only about 10% are totally without sight (Best & Corn, 1993). Since the impairment may affect visual acuity, visual field, photosensitivity and/or stability of vision the functional implications of vision impairment vary between individuals (e.g. difficulties viewing fine detail and/or moving about outdoors) (Chen, 1999a).

Vision impairment significantly reduces the amount of information that children are able to obtain from the environment. Experiences that are encountered incidentally by sighted children through visual observation are limited for children with vision impairment. Vision impairment has a potentially negative effect on all domains of development, including: social and communicative (Baird, Mayfield, & Baker, 1997); cognitive (Dale & Sonksen, 2002; Ross, Lipper, Abramson, & Preiser, 2001); motor (Bouchard & Tetreault, 2000; Levtzion-Korach, Tennenbaum, & Schnitzen, 2000); perceptual-spatial (Fletcher, 1981); and independence (S. Lewis & Iselin, 2002). Infants, toddlers and school age children with vision impairment demonstrate skills and abilities below that of their peers. They are at increased risk not only of developmental delay, but developmental setback (Dale & Sonksen, 2002; Ferrell, Shaw, & Deitz, 1998).

Table 2.1. Classification of vision impairment

Classification	Category of vision impairment	Best corrected visual acuity	Best corrected visual field
	Mild	< 6/12 – 6/18	Hemianopia
Low vision	Moderate	< 6/18 – 6/60	< 20 degrees
	Severe	< 6/60	< 10 degrees
Blind			

Note. Extracted from Mirdehghan (2005) and VanNewkirk, McCarty and Taylor (2001).

Generally the more severe and earlier the onset of vision impairment, the greater the developmental impact (Dale & Sonksen, 2002). While this is generally accepted, some argue that the many cases of children with vision impairment who demonstrate development within typical norms should stand as proof that vision impairment by itself does not produce slowed development (Warren, 2000). Despite this, the antecedents explaining the variation among children with vision impairment have not been identified.

The causes of childhood vision impairment in developed countries have changed over recent times. In particular, dramatic rises in neurological conditions and syndromes have been noted (Du et al., 2005; Lovie-Kitchin & Bevan, 1982). Cortical vision impairment is now the main cause of childhood vision impairment in Australia (Du et al., 2005), the US, UK and New Zealand (21 - 48%) (Kelley, Sanspree, & Davidson, 2000; Rahi & Cable, 2003; Rogers, 1996). Other major causes in Australia include albinism (11%), retinopathy of prematurity (7%), optic atrophy (6%), and optic nerve hypoplasia (5%) (Du et al., 2005).

The rise in neurological causes is linked to an increase in co-existing disabilities among children with vision impairment. It has been estimated that 43 to 77% of children with vision impairment in developed countries have at least one additional disability (Bishop, 1991; Crofts, King, & Johnson, 1998; Hatton, Bailey, Burchinal, & Ferrell, 1997; Rahi & Cable, 2003; Riise et al., 1992; Rogers, 1996). Common disabilities include cerebral palsy, intellectual or hearing impairment, autism, hemiplegia, epilepsy, learning disabilities, and medical conditions (Chen, 1999a; Pagliano, 2002; Rogers, 1996). The severity of these disabilities, and their interaction with vision impairment and early development varies considerably (Chen, 1999c).

2.3 HISTORY, LEGISLATION AND DELIVERY OF INCLUSION

The last four decades have seen significant change in the provision of education for children with disabilities. The human rights movement of the 1960's saw a shift away from the segregation and institutionalisation of people with disabilities to a philosophy of normalisation and integration. In the late 1980's a consolidated movement, led by advocacy groups, special educators and academics, pushed beyond mere physical integration to the *inclusion* of children with disabilities in regular education settings.

Inclusion is a philosophy based on a notion of social justice that advocates equal access to all educational opportunities for *all* students, regardless of the presence of a disability (OECD, 2005). Based largely on constitutional grounds and ethical considerations, inclusion is characterised by education programs that provide appropriately for students through both physical and curricular means (Elkins, 2002).

Whereas integration referred primarily to a student merely being enrolled in a regular program, inclusion involves a commitment to designing programs that fit children with disabilities, rather than requiring the child to fit the program. Instructional practices are designed to cater for all children, including those with diverse learning characteristics (Gale & Cronin, 1998). Inclusion applies equally to children without disabilities (e.g. from disadvantaged backgrounds, with learning difficulties); however, this thesis focuses primarily on the inclusion of children with disabilities.

Variations exist in the definition and delivery of inclusion. The model of inclusion varies widely with regard to contact time in the regular class. In some instances, the definition of inclusion involves students who are based in regular classrooms but spend some time in specialised units or classes designed to cater for children with disabilities. In this thesis, inclusion refers to a situation in which children attend a regular class full time, with support from specialised service providers as required. However, it is possible for students to attend a regular class full time without being included; therefore, the outcome of inclusion is of most significance. Inclusion is the outcome of a process whereby schools attempt to provide for the personal, social, and learning needs of the student (D. Power & Hyde, 2002).

Inclusion is now an accepted ideology, supported by international and national legal frameworks. The international 1994 Salamanca Statement (United Nations Educational Scientific and Cultural Organization [UNESCO], 1994) (recently reinforced by the Dakar Framework for Action 2000) urged international governments to adopt inclusive educational policies by enrolling all students in local schools. Individually, countries adopted legislation for the rights of all students to receive equitable education. Examples include the US Individuals with Disabilities Education Act (2004) and the UK Education Act (1993). The Australian Disability Services Act (1986), Disability Discrimination Act (1992) and School Education Act (1999) mandate the rights of children with disabilities to access educational services in their local school in Australia (ABS, 2000). Most recently, the Australian Disability Standards for Education 2005 (the Standards) were enacted to further legislate the principles of inclusion (Commonwealth of Australia, 2005). The Standards specify the ways that education and training are to be made accessible to students with disabilities, with regard to enrolment, participation, curriculum development, accreditation and delivery, student support services, and elimination of harassment and victimisation (J. Power & Angela, 2006).

While supportive state legislation existed throughout Australia, the state education authorities underwent major reviews in an effort to develop educational policies (and practices) more consistent with current attitudes and the impending Standards (DET WA, 2002; Department of Education Training and the Arts Queensland [DET QLD], 2006; Department of Education and Training New South Wales [DET NSW], 2005). Policy, training and funding changes are currently being implemented to support the move towards inclusion (Commonwealth of Australia, 2005; DET WA, 2004; DET QLD, 2006; DET NSW, 2005). Until recently, states have implemented these strategies with varying degrees of success (Wills & Jackson, 2000b), however the impact of the new federal legislation is yet to be determined. Concerns persist that the non-government early education and child-care sector may be lagging even further behind (Kilgallon & Maloney, 2003; Llewellyn et al., 2002).

Internationally, the integration and inclusion movement have influenced the nature and delivery of education to children with disabilities (Blatch et al., 1998). Particularly in developed countries, it has resulted in increased enrolments of students with disabilities at regular schools. In Australia, the majority (62%) of school students with disabilities aged below 14 years attend a regular class in a regular school (Australian Institute of Health and Welfare [AIHW], 2006). While a continuum of educational placements still exists for students with disabilities, this reflects a dramatic increase in regular school placements and a decline in the number of special schools (ABS, 1999; DET NSW, 2002; Loreman & Deppeler, 2000).

Isolated cases of integration of students with vision impairment in Australia occurred as early as 1939. But it was not until the 1980's that attendance at local schools became the norm for blind primary school students (Buckrick, 2004; Laffey, 2004). Nowadays, the majority of students with vision impairment in Australia attend their local school with support from itinerant teachers specialised in vision impairment (referred to as *visiting teachers* in this thesis) (ABS, 2000; Blatch et al., 1998; Gale & Cronin, 1998; Pagliano, 2002) (Table 2.2). Children with sensory impairment are less likely than those with physical disabilities to be enrolled full time in an ordinary class in Australia; but they are enrolled more often than children with intellectual, mental or behavioural disorders (ABS, 2000).

The decision for educational placement is typically based on the principle of the least restrictive environment (Blatch et al., 1998). However it is also influenced by other factors such as population distribution, geographical features, availability of specialised class places, funding and the historical growth of services (Gale & Cronin, 1998). Children with more profound disabilities continue to attend specialised educational settings than those with moderate or mild impairment (AIHW, 2006; Loreman & Deppeler, 2000) This is true for children with vision impairment (Table 2.2) as well as those with other disabilities.

Table 2.2. Educational placement for children with vision impairment by educational setting in Western Australia in 2006 and Queensland in 1998

Educational setting	% of children with vision impairment (% with co-existing intellectual disability)	
	Western Australia 2006 [a]	Queensland 1998 [b]
Regular class in regular school	68.1 (2.6)	71.3
Special early education class	0.5	5.0
Special education unit in regular school	4.3 (100)	11.3
Special centre at regular school	5.8 (100)	-
Generic special school	21.3 (100)	8.0
Specialised school for students who are blind	N/A	2.0

Note. N/A = Not applicable (there are only specialised schools for students who are blind in South Australia, Victoria, Queensland and New South Wales).
[a] Kindergarten to grade 12 (D. Wilkinson, personal communication, October 12, 2006). [b] Primary to grade 12 (Blatch et al., 1998, p. 25).

The inclusion movement has created expectations for an expanded and localised provision of specialised resources. This includes personnel (specially trained teachers and education assistants), equipment, and materials to meet student needs in regular schools (Blatch et al., 1998). The support needs of students with vision impairment at regular classes vary. During 2002 the majority of children with vision impairment in regular classes (87%) had moderate support needs; while some had high (1%) or low

(12%) support needs (DET NSW, 2002). This reflects the heterogeneity that exists within the population of children with vision impairment. Placement, support and inclusive outcomes need to be considered on an individual basis.

The shift in inclusive policy has seen a steep rise in the number of children with disabilities attending regular schools over the last 15 years. At the very least, physical inclusion (or integration) exists in Australia; more so for those children with less severe disabilities. Given the high proportion of children with disabilities (including vision impairment) now attending regular settings, it is critical to evaluate whether their experience is a positive one, and if not, to determine the reasons for this. While legislation ensures that inclusive principles will remain, and probably tighten, the issue of educational placement remains a contentious one. Proponents and opponents argue each side. A statement by the International Council for the Education of People with Visual Impairment (ICEVI) and the World Blind Union (WBU) reflects the debate central to the inclusive education of children with vision impairment. These international organisations:

> Support inclusive education as one of the alternative models of service delivery, on condition that all necessary steps are taken to first put in place the required number of teachers trained in the special needs of blind and low vision children and the essential support systems, the necessary equipment, Braille books, and low vision devices to guarantee true inclusion. (ICEVI and WBU, 2003 , p.2)

This provisional support of inclusion highlights two important points. Firstly, concern exists that the appropriate provisions are often *not* provided to support inclusion, and as a result, inclusive education is often not attained. Secondly, much debate has taken place concerning the viability of inclusion as a realistic educational option for *all* students, and this debate continues as the research base about inclusion grows and informs arguments. Some fear that inclusion is a conservative agenda, driven by economic and social reform; and based more on ideals than research (Foreman, 1996; Fuchs & Fuchs, 1994–95; Shanker, 1994–95).

Given these concerns, it is important to examine the effects of inclusive policy on the education of children with disabilities, particularly those with vision impairment. The following section reviews current literature about the effectiveness of inclusion (regular class placement versus specialised educational setting) to determine if inclusive placement in itself has an effect on the outcomes of students with disabilities, their classmates and the perception of stakeholders.

2.4 THE EFFECTIVENESS OF INCLUSION

2.4.1 Effect on Students with Disabilities

Evidence for the effectiveness of inclusive education can be best described as equivocal. But at the same time, there is little evidence for the superiority of specialised education settings. Reviews and meta-analyses have investigated research measuring the effect of inclusive education on student outcomes. Several were conducted prior to 2000 (Baker, Wang, & Walberg, 1994; Carlberg & Kavale, 1980; Madden & Slavin, 1983; Sebba & Sachdev, 1997; Wang & Baker, 1985-1986), and two more recently (Kalambouka, Farrell, Dyson, & Kaplan, 2005; Lindsay, 2007). The studies included in the reviews compared a wide variety of disabilities, age ranges and outcomes; however none of the reviews concluded clear evidence for the benefit of inclusive education. Three meta-analyses (of N = 11 - 50 studies) prior to 2000 found positive, but generally small, effect sizes on the academic (effect size 0.08 - 0.44) and social (effect size range 0.11 - 0.28) benefits of regular versus specialised educational placement. More recently, a review of articles published between 2000 and 2005 (N = 1373) found 14 comparative outcome studies of children with disabilities (Lindsay, 2007). Some studies concluded positive effects (n = 2); and others reported negative effects (n = 2), mixed results (n = 3), interaction effects of disability level (n = 2) or no effect (n = 5) of regular setting over specialised setting. A clear endorsement for the positive effects of inclusion could not be made. Furthermore, interaction effects of disability severity and educational setting have been reported in randomised controlled trials (Mills, Cole, Jenkins, & Dale, 1998) and randomised cohort studies (Cole, Mills, Dale, & Jenkins, 1991). These studies found no main-effect differences between groups of preschool students by setting alone; however, higher performing students benefited more from integrated [sic] classes, whereas lower performing students benefited more from specialised settings.

Although children with vision impairment were among the first students with disabilities to be included in regular classes, there is insufficient documented evidence to suggest that their inclusion is consistently effective. Two studies have investigated the social effects of educational setting for children with vision impairment: one found positive effects of regular over specialised classes (D'Allura, 2002), and the other found positive, but non significant trends (Erwin, 1993).

The first was a prospective, longitudinal, observational study of children in a preschool for children with visual impairments (D'Allura, 2002). It compared the effects of reverse-mainstreaming versus self-contained (specialised) class setting on the social interaction patterns of preschoolers with (n = 9) and without vision impairment (n = 4). At baseline, the five children with vision impairment in the self-contained class spent three times as long in solitary play (M = 117 minutes) as children with vision impairment (M = 36 minutes) and sighted peers (M = 40 minutes) in the reverse-integrated class. In addition, children in the segregated class spent most time interacting with adults (61%). A self-contained group main effect existed [$F(1,12) = 8.13$, $p < .05$], which did not change over time. Despite a very small sample size, many hours of observation data were analysed (three sessions per week over 20 weeks), and a control group was utilised. However, the reverse-integrated program was specifically designed for children with vision impairment (environmental and curricular aspects), and utilised an experienced teacher.

The second study found no significant differences in patterns of social participation of pre-primary school children with vision impairment (N = 28, some with additional disabilities) in integrated [sic] and segregated settings (Erwin, 1993). The inconclusive results may be attributable to the heterogeneous and small sample. However, mean results suggested a trend towards children in the segregated setting spending more time in unoccupied behaviour than with other students or teachers. Furthermore, anecdotal observations revealed behaviour differences among children with co-existing disabilities between settings. In contrast to the segregated setting, no challenging behaviours were observed in the integrated classroom and the children with additional impairments spent more time in activities with their classmates.

Some research has assessed the long term outcomes of inclusive education for children with vision impairment. One comparative case study monitored young people with vision impairment (N = 2) over six years, and illustrated that early integration [sic] is more beneficial than late integration (Dimigen, Roy, Horn, & Swan, 2001). The student who experienced early integration reported feelings of satisfaction, independence and confidence; while the participant who was integrated at 16 years of age reported feelings of dependence and dissatisfaction (Dimigen et al., 2001). In addition, a retrospective study reported that educational setting is associated with the employment of people with vision impairment (Leonard et al., 1999). Respondents who attended an integrated setting for most of their schooling (n = 91) were 74% more likely to be employed than those who did not (n = 76) [$B(1,91) = .55$, $R = .12$, Exp (B) = 1.74, $p < .05$) (Leonard et al., 1999). The children with vision impairment who attended regular schools may have developed and retained skills that influenced later employment outcomes. However, causal relationships cannot be concluded from the study.

While evidence for the benefits of regular education placement are not conclusive, there are indications that educational setting may positively benefit the social, emotional, and behavioural outcomes of children with vision impairment.

2.4.2 Effect on Classmates

Another important consideration of inclusive education is how it affects classmates. A systematic review of 26 studies about the impact of inclusion on children without disabilities identified 23% positive, 15% negative, 52% neutral and 10% mixed findings (Kalambouka et al., 2005). Most of the studies reviewed addressed the inclusion of students with learning or cognitive disabilities, but the inclusion of students with emotional and behavioural difficulties tended to have a more negative impact on classmates. No such evidence when the included students had physical, sensory or communicative difficulties. Furthermore, in a causal-comparative study that collected observational data of students in an inclusive primary school over five months (aged 6.5 to 10 years, n = 6 with severe mental retardation and no verbal communication, $n = 6$ classmates and $n = 6$ peers from a different classroom), there were no significant differences in instructional time received between classes, nor evidence of significant disruptions for classmates (Hollowood, Salisbury, Rainforth, & Palombaro, 1994). These results need to be considered cautiously, since the study involved a small sample size with no random assignment of students to classes.

Evidence suggests that the inclusion of children with disabilities does not impact negatively on classmate outcomes or the instruction received. Furthermore, the instructional costs demonstrate the economic benefits of inclusive education. In a cost-analysis, instructional costs of inclusive education were less than that of specialised education (Odom, Hanson et al., 2001; Odom, Parrish, & Hikido, 2001).

2.4.3 Stakeholder Perception

The perception of parents and students is of prime importance in the inclusion debate. Parents have expressed diverse views in their preference of educational placement for their child with disabilities (J. O'Neil, 1994). While many Australian parents have indicated positive attitudes towards the inclusion of their child with a disability (Bennet, 2003), particularly in regards to the social benefits (DET NSW, 2002; Epstein-Frisch, 2000), the fragility of current inclusive arrangements have also been emphasised. Parents have expressed concern about the sharing of finite resources among many schools and the discrepancy of inclusive experiences among classes and teachers (DET NSW, 2002).

The variation expressed by parents was examined in a study of Victorian parents of children with disabilities ($N = 193$) (Jenkinson, 1998). Parents who chose regular school placements for their child did so for normalisation and academic reasons. Other parents chose special settings because of the importance they placed on specialised programs, teacher-student ratios, and the perceived effects on children’s self-esteem. Parents of children with physical or sensory disabilities were more likely to emphasise academic aspects than were parents of students with intellectual disabilities. Students themselves have also described the pros and cons of educational settings. A synthesis of eight studies that surveyed students with learning disabilities ($N = 442$) found that the majority preferred to receive specialised instruction outside the general classroom for part of the day (Vaughn & Klingner, 1998). Resource room work was fun and assistance was available. However, students felt that the regular classroom was better for making friends and the support provided by the special education teacher in the general education classroom was valued.

Parents emphasise the importance of a continuum of educational placement options remaining available. In a public inquiry into education in Australia, some parents indicated satisfaction with the current placement continuum and others indicated a desire for this to be further enhanced (Crosby, 2002). Experts agree, and have long emphasised the importance of making educational placement decisions based on the least restrictive environment (Curry & Hatlen, 1988), warning that "trying to force everybody into the inclusion mould promises to be just as coercive as trying to force everybody into the mould of special class or institution" (J. O'Neil, 1994, p.21). These sentiments have been echoed by stakeholders in the vision impairment field.

While parents of children with and without vision impairment in playgroups ($N = 32$) (Friedman, 1989) and primary schools in Illinois ($N = 13$) (Leyser & Heinze, 2001) were generally supportive of mainstreaming (citing the value of learning, acceptance and social interaction), others have identified a number problems with inclusive education (Leyser & Heinze, 2001; Royal Blind Society, 1996). Common concerns focused on the potential for social isolation and loneliness, the lack of opportunities for participation, limited access to information and the unwillingness of some teachers to include and make accommodations for students with vision impairment.

The academic merits of specialised educational settings for students who are blind have also been argued by secondary students with vision impairment (Phillips & Corn, 2003); experts in the field (Blatch et al., 1998; Chen, 1999a); and peak advocacy groups (J. Power & Angela, 2006). They argue that the equipped and trained professionals, specialised resources, and individual attention of the special schools were advantageous. In particular, concern exists about lack of equal access to Braille literacy for children with vision impairment in regular classes. Stakeholders have, however, conceded the social benefits of inclusive and the restrictions imposed by segregated placements.

2.4.4 Summary

While outcome studies of students with and without disabilities have not been able to emphatically endorse inclusion, few negative effects are evident. Stakeholders highlighted the potential benefits and risks of inclusive placement for children with disabilities and vision impairment, with much disagreement regarding the potential social and academic benefits and risks. While inclusion has been examined from a theoretical perspective, the review will now examine how inclusion is actually implemented in Australia; particularly, how students with vision impairment fare.

2.5 DEFINITION OF INCLUSIVE OUTCOMES

Inclusion has been described as comprising of three aspects: (1) physical presence in a regular class, (2) social interaction, and (3) curricular inclusion (Wills & Jackson, 2000b). While the adequacy of physical inclusion has been demonstrated by increased student enrolments, social and curricular inclusion requires further investigation. In previous studies, inclusive or integrative outcomes have included: social interaction, involvement in the curriculum or the opportunity to learn, participation in typical classroom activities, engagement in tasks, and/or academic achievement (Bishop, 1986; Brown, Odom, Li, & Zercher, 1999; Center, Ferguson, & Ward, 1988; Davis & Hopwood, 2002a; Pivik, McComas, & Laflamme, 2002; Wills & Jackson, 2000b).

Some authors argue that social interaction with peers is the major goal of inclusive education for children with disabilities, citing the positive effects of social inclusion on self-esteem, behaviour, future academic achievement and quality of life as justification (De Rosier, Kupersmidt, & Patterson, 1994; Nisbet, 1996; Vitaro, Trembley, & Gagnon, 1992). However, others oppose this focus, stating that students with disabilities must achieve reasonable academic levels for schooling to be considered successful (Stinson & Antia, 1999). Indeed, parents and teachers expect academic performance from children with vision impairment (Department of Education Science and Training Australia, 2005); with comparison to sighted classmates an appropriate measure (Koenig & Holbrook, 2000b).

Curricular involvement has been described in two main ways: participation and engagement. The two terms often used synonymously. Engagement has been defined as consisting of on-task behaviour, both active (e.g. actively responding in a relevant manner) and passive behaviours (e.g. attending to instruction or ongoing class activities) (Hollowood et al., 1994; Shukla, Kennedy, & Cushing, 1999).

While few would disagree that engagement and child interaction are expected for students with disabilities in regular education, some may argue that the participation of children in class activities (as opposed to withdrawal or specialised activities) is unnecessary, impractical, or even detrimental to their learning and developmental. Withdrawal or specialised activities is a common strategy used by therapists and teachers to target individual objectives and learning needs, manage behavioural issues, and provide accessible tasks (Cable & Case-Smith, 1996). However, the withdrawal of children from class activities has the potential to segregate them further – highlighting their differences and reducing opportunities to interact with peers. In the literature, participation has been defined from basic involvement (attending school, work preparation, social participation or responding to the teacher's direction) through to broad concepts (such as bonding or identification with the school and student involvement in decision making in the school environment) (Finn, 1989; Simeonsson et al., 2001). Participation in regular education classes has been recommended as a primary goal for children with vision impairment (Davis & Hopwood, 2002a).

In this study, inclusive outcomes in education comprises of four components: (1) participation (being involved in the same activities that typically developing peers are, as opposed to being involved in a separate activity); (2) engagement (appropriate on-task behaviour opposed to waiting or misbehaviour); (3) child interaction (social interaction); and (4) academic performance.

These components reflect previous research constructs and stakeholder perception of inclusion, and are also congruent with a contemporary international framework of disability, the World Health Organization's International Classification of Functioning, Disability and Health (ICF) (WHO, 2001) (see section 2.7). This framework defines participation in informal, preschool and school education (ICF code d810—820) as a holistic occupation, that involves "engaging in all school-related responsibilities and privileges…learning course material…[and] working cooperatively with other students" (p. 164).

Finally, the level of inclusive outcomes required consideration. Is performance *equal* to peers the *right* outcome, and is it a reasonable expectation for children with vision impairment? Given potential developmental delays, lack of visual feedback and possible additional disabilities, many children experience severe barriers to interacting with others, learning concepts and accessing visual tasks. However, experts argue that there is no reason, given appropriate supports and modifications, that children with vision impairment cannot be involved in the regular curriculum or achieve to their potential (Palmer, 2000a). Certainly parents desire their children to be involved socially with other students and have reported distress at the isolation of their children at school (RBS, 1996). Engagement and participation in learning concepts are considered to be fundamental before learning can even take place (Soukup, Wehmeyer, Bashinski, & Bovaird, 2007). From this evidence, it would be argued that it is appropriate to aim for the attainment of equal levels of participation in activities, engagement in tasks, interaction with other children and academic achievement for children with vision impairment in regular classes.

The four components of inclusive outcomes are now reviewed. Specifically, evidence about the inclusive outcomes experienced by students with disabilities, particularly those with vision impairment, in regular education is discussed.

2.6 INCLUSIVE OUTCOMES OF STUDENTS

Among children with disabilities who attend regular classes, inclusion may only exist for particular students in a small number of schools (Elkins, 2002). In 2000, a nationwide study for UNESCO provided a snapshot of inclusive education practice in Australia (Seymour, 2000; Wills & Jackson, 2000b). In forums and surveys, stakeholders rated the level of physical, social and curricular inclusion in each state (from *A+* to *F*). Stakeholders included parents, advocacy groups, people in the field of disability, academics and educators [n = 89 Western Australian participants (Wills & Jackson, 2000a); n = 21 Victorian groups, (Loreman & Deppeler, 2000); n = 18 Queensland representatives (Seymour, 2000); and an undisclosed sample size in New South Wales (Epstein-Frisch, 2000)]. According to the findings, while the number of children with disabilities physically included in regular education programs in Australia increase, those who attended regular classes experienced less than acceptable social and curricular inclusion (Wills & Jackson, 2000b). Similar findings have since been reported (Kemp & Carter, 2002; Llewellyn et al., 2002; Sutherland, 2001). In addition, a Western Australian Department of Education and Training inquiry concluded that educational practices for children with disabilities at that time did not meet standards of legislation during 2001 (DET WA, 2001). While these studies were conducted prior to the enactment of the Disability Standards for Education 2005, they provide a scathing review of the state of inclusion in Australia.

The state of inclusive education has also been raised as a matter of concern for children with vision impairment in Australia. Many programs claim to provide inclusion, however, it has been argued that many children with vision impairment do not have the advantages of social and curricular inclusion (Gale & Cronin, 1998). Concerns exist about the ability of teachers to include students with vision impairment in the regular curriculum (Horne, 1983; Wall, 2002) and subsequent difficulties have been described (Brambring, 2001). As mentioned, Australian parents also have expressed concerns regarding the quality of their child's educational experience (Jenkinson, 1998; Royal Blind Society and Royal Institute for Deaf and Blind Children, 1999).

However, beyond these claims, a limited amount of research has actually evaluated the quality of inclusion experienced by students with vision impairment. The ABS found that in 2003 half (53.2%) the students with sensory disorders experienced schooling difficulties (ABS, 2004). Learning difficulties (31.2%), fitting in socially (26.9%), and communication difficulties (24.5%) were also common. While these results are not specific to those with vision impairment, they suggest that problems do exist. In contrast, an older Australian study dismissed such problems. In 1988, eight children with sensory disabilities in New South Wales schools (grades 2 to 6, *n* = 4 with vision impairment) were all effectively mainstreamed [sic], receiving a total Integration Index rating of 93.4 (scores of 90 - 95 = *successful mainstreaming with only some reservations*) (Center et al., 1988). While the small sample size restricts the generalisation of results, it indicates that the potential to effectively include children with vision impairment exists.

Despite the legislative and policy support of inclusion, it appears that many children with vision impairment do not experience adequate social or curricular inclusion in Australia. Research has highlighted difficulties experienced by children with sensory impairment in regular education; however the potential for success has also been demonstrated. The next section explores the performance of children with disabilities (particularly with vision impairment) in more detail. The four inclusive outcomes are reviewed: participation, engagement, child interaction and academic performance.

2.6.1 Participation

Participation refers to the involvement of students with disabilities in class activities as other classmates, rather than assignment to a sole activity or withdrawal from class (Wolery et al., 2000). Stakeholders in Australia have reported that students with disabilities do not participate in the same curriculum or activities as classmates (Loreman & Deppeler, 2000). Rather, they typically spend the majority of their time grouped by themselves, or withdrawn with an adult to work on a different curriculum. Beyond these concerns, limited research demonstrates the degree to which students with disabilities are involved in the general education curriculum. This is in part because the focus of special education services has historically been to ensure student progress in core learning areas or socialisation (Soukup et al., 2007).

It has been argued that, with modifications, the regular curriculum should be available and accessible by students with vision impairment (Palmer, 2000a). Best practice examples have been observed (Davis & Hopwood, 2002a). However, a descriptive study of US primary and high school teachers (N = 1,180) suggested that this may not be typical (Simeonsson et al., 2001). In the study, that participation of children with disabilities was defined as an aggregate score of participation in social and academic activities that individual children had the opportunity to be involved in (negative scores indicated poor participation). Students with vision impairment (n = 88) had the fifth highest participation score of thirteen disability groups (M = -.02, 95% CI = -0.26, 0.21). Children with multiple disabilities had the lowest participation (n = 25, M = -.39, 95% CI = -0.75, -0.03). Although this study lacked direct observation and a typically performing comparison group, the large sample size provides evidence that a moderate participation problem may exist among students with vision impairment in regular classes.

Further research has since indicated that participation in physical education may be particularly problematic. Participation in physical education was problematic among 24% of students who were legally blind (N = 9) in the US (Leiberman, Robinson, & Rollheiser, 2006); teachers and parents of children with albinism in Australia (N = 10) (Palmer, 2003); and 20% of participants aged five to 16 years with vision impairment in Perth (N = 12) (Packer, Briffa, Downs, Ciccarelli, & Passmore, 2006). Instances of restricted access to the lesson, through to outright exclusion were described.

Due to the small sample sizes and the lack of objective measurement/observation, these findings need to be considered with caution. However, collectively, the studies provide evidence that students with vision impairment may be participating in regular education at lower levels than their potential.

2.6.2 Engagement

Engagement refers to the purposeful involvement in, or attention to a task (Wolery et al., 2000). Generally, students with disabilities spend less time engaged than their typically developing classmates. This has been observed in cross-sectional cohort studies of children of varying ages: in childcare facilities (peers $M = 10$, $SD = 11.76$ vs. children with disabilities $M = 21$, $SD = 4.6$, $F(48) = 14.2$, $d = 1.2$, $p < .001$) (McWilliam & Bailey, 1995); kindergarten (peers $M = 31.7$, $SD = 6.9$ vs. children with disabilities $M = 26.3$, $SD = 7.8$, Cohen's $d(330) = 1.1$) (Elliot, Diperna, Mroch, & Lang, 2004); and primary school (Hollowood et al., 1994; Hudson & Clunies-Ross, 1984; K. R. Logan & Keefe, 1997). In addition, the amount of time spent engaged during the school day has been described. Using an ecobehavioural observation assessment (CASPER II) preschool children with mild to moderate disabilities ($N = 142$) were found to be engaged in activity for as little as 55% of the school day (Odom & Buysse, 2005). Participants in some of the studies had intellectual impairment, which may have negatively skewed results. In addition, the engagement levels of typically developed students were not described.

Some evidence suggests that preschool aged children with vision impairment may demonstrate poorer engagement than classmates. Three separate case studies, noted difficulties experienced by preschool and pre-primary children with vision impairment engaging in play (Kekelis & Sacks, 1988; Tait & Wolfgang, 1984) and visually based activities (Taylor-Hershel & Webster, 1983). Passivity in activities was also observed (Tait & Wolfgang, 1984). However, these studies did not focus specifically on engagement, so they did not record time engaged in activity nor did they utilise comparison groups.

It is difficult to conclude the level of engagement demonstrated by children with vision impairment. However, given the findings from the general disability field, further investigation is warranted.

2.6.3 Child Interaction

The quality of social inclusion experienced by children with disabilities in Australia reportedly varies from school to school, and is worse for students with more severe disabilities (Epstein-Frisch, 2000; Loreman & Deppeler, 2000; Seymour, 2000; Wills & Jackson, 2000a). Quantitative observation of students in New South Wales (Kemp & Carter, 2002), and teachers and student reports in Western Australia (Sutherland, 2001) illustrate the social problems encountered by some primary school children with disabilities. Stark differences existed in the amount of time children with and without disabilities spent interacting with peers and there was evidence of rejection and negative attitudes from classmates. Similar findings are reported internationally (Brown et al., 1999; Cappelli, Daniels, Duriex-Smith, McGrath, & Neuss, 1995).

A large body of research has focused on the social characteristics of children with vision impairment. Research, particularly using case study design has described the social interaction between young children and their peers in regular early education (Celeste, 2006; Erwin et al., 1999; Kekelis, 1992b; Kekelis & Sacks, 1988; Taylor-Hershel & Webster, 1983). Among young children, studies have compared children with and without vision impairment in terms of child interaction (McGaha & Farran, 2001; Troster & Brambring, 1992, 1994) and/or adult social interaction (McGaha & Farran, 2001). Research has described friendship patterns (Leyser, Heinze, & Kapperman, 1996; Palmer, 2003) and reported parental and child concerns among older children (Heinze & Leyser, 1998; RBS & RIDBC, 1999).

Research has consistently identified differences in the interaction patterns of children with and without vision impairment. Descriptive studies utilising naturalistic observation of social interactions of children with vision impairment (N = 18 - 20) have reported that children with vision impairment interact less frequently; often play by themselves (Crocker & Orr, 1996; Troster & Brambring, 1994); and spend more time interacting with adults compared to matched groups of sighted children (Crocker & Orr, 1996; McGaha & Farran, 2001). One study observed that all children (both sighted and vision impaired) spent more time interacting with sighted children than peers who were blind (McGaha & Farran, 2001).

Communication breakdown is common among preschool children. Five separate case studies of children between three and four years old demonstrated similar findings: children with vision impairment commonly failed to respond to classmates initiations (Celeste, 2006; Kekelis, 1992a; Kekelis & Sacks, 1988; Taylor-Hershel & Webster, 1983); were less likely to initiate interactions (McGaha & Farran, 2001); and had difficulty keeping up with highly mobile peers in play (Erwin et al., 1999). These difficulties were often magnified because of the primarily non-verbal nature of young children's communication (Erwin et al., 1999; Kekelis, 1992b; Kekelis & Sacks, 1988). As a result of these communication difficulties, misinterpretation of behaviour or intention was common and resulted in children being neglected or ignored outright by their sighted peers (Erwin et al., 1999; Kekelis, 1992b). While these studies each describe isolated cases, they are based on extensive observational data and report similar findings – preschool children experience difficulties in child interaction.

Social problems have also been reported among primary school aged children with vision impairment. Parents (*N* = 37 - 122) have reported that their primary aged children experience social difficulties (RBS & RIDBC, Royal Blind Society, 1996; 1999) and exhibit few friendships (Leyser et al., 1996; Palmer, 2003; Royal Blind Society, 1996). In a qualitative study by the former Royal Blind Society in New South Wales, over half (58%) the parents (*N* = 122) reported that their child (80% of whom attended regular classes) had one or more areas of difficulty in social interaction. These related to primarily to teasing (37%), playing with peers (30%), mixing with peers (28%), or making friends (21%). Generally, parents of older children tend to describe concerns regarding isolation or rejection (Heinze & Leyser, 1998; Royal Blind Society, 1996).

Research has demonstrated social difficulties experienced by children with vision impairment at preschool, primary school and high school. According to the literature, social isolation, communication breakdown, and rejection are common in regular settings. Australian parents have confirmed that these problems exist for their children. It appears that merely placing children with vision impairment in the same class as sighted peers does not guarantee meaningful interaction and social inclusion.

2.6.4 Academic Performance

Research about the academic performance of children with vision impairment has focused on literacy achievement (A.L. Corn et al., 2002), particularly Braille literacy (Fellenius, 1996; Wall & Corn, 2004). The effect of vision impairment on the academic achievement of students with vision impairment in regular education is inconclusive with existing knowledge. While one systematic review concluded that the quality of literature linking visual deficits to learning deficits was insufficient to strongly predict school performance (Snowden & Stewart-Brown, 1997), another review concluded that students with vision impairment are able to attain the same literacy and numeracy outcomes as peers, provided particular consideration is given to learning materials and methods (Palmer, 2000a).

Individual studies have also reported mixed academic outcomes. The majority of school students with vision impairment may read *at* grade level (Wall & Corn, 2004), but they demonstrate variation in reading speed and fluency (Fellenius, 1996). Reading speed is an important component of academic success. When reading speeds are not competitive with that of sighted classmates, children with low vision are at risk of academic difficulties (A.L. Corn et al., 2002). Further studies have reported a relationship between vision impairment and difficulties in reading (Ek, Fellenius, & Jacobson, 2003; Farrag, Khedr, & Abel-Naser, 2002; Gompel, Janssen, van Bon, & Schreuder, 2003) and attention (Tonge, Lipton, & Crawford, 1984). Others link vision impairment with lower overall academic success (Buhrow, Hartshorne, & Bradley-Johnson, 1998; Reed, Kraft, & Buncic, 2004). The variation in findings among studies may be explained by the different outcomes and measurement instruments used. However, it is probable that the variation in reported academic achievement reflects the heterogeneity within the group of children with vision impairment (Gale & Cronin, 1998). It is evident that the group of children with vision impairment is a heterogeneous one, with diverse abilities, educational potential and needs, as well as a variety of inclusive experiences.

2.6.5 Summary of Inclusive Outcomes

While many early education programs in Australia are now striving for the inclusion of children with disabilities, it is clear that practice still falls below the ideal. Children with vision impairment are being educated in a climate where concerns exist about curricular and social inclusion. Possible developmental delays, the interaction of co-existing disabilities, and a reduced ability to learn from the visual environment put these children further at risk of poor outcomes in regular education.

Social and academic difficulties experienced by children with vision impairment are commonly described in the literature. While some difficulties in participation and engagement have been observed, dedicated research has not quantitatively measured these outcomes among children with vision impairment. Given the recent focus on Participation and inclusion, engagement and participation in regular education are now relevant and critical constructs to measure. In addition, with the exception of a few studies (e.g. D'Allura, 2002; Kekelis & Sacks, 1988), longitudinal design is generally not utilised to describe the relative performance of children with and without vision impairment in education over time. As yet, it is unknown if differences between the performance of children with and without vision impairment are evident when children commence education, or whether these emerge over time.

Finally, the benefits of segregated and regular placements continue to be argued among stakeholders. Poor social or academic outcomes in regular settings are used as evidence to support the specialised education of children with vision impairment. Instead, this may highlight the need to foster inclusion. As Erwin (1991) described,

> The real issue is not whether integration works (ethical and legal reasons demand its presence), but the need to explore critical variables to achieve success. When specific elements that contribute to or interfere with a child's progress are identified, instructional and environmental strategies can be implemented to increase the potential of children. (p. 258)

Erwin's concerns during the early 1990's persist today. There is still a lack of knowledge about the mediators of inclusion for children with vision impairment. A review was undertaken to determine what is known about such mediating factors. The review was guided by an overarching framework. The next section describes and justifies the framework. The review of factors influencing inclusion then follows.

2.7 INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH

When considering the literature surrounding factors that influence the inclusion of children with disabilities and vision impairment, the factors tended to group into three main themes: (1) child factors; (2) family background factors; and (3) class, school, or teacher factors (Bishop, 1986; George & Duquette, 2006; Kekelis & Sacks, 1988; Powers, 2003). A theoretical framework was sought to reflect the multifaceted nature of the literature and also to assist in investigating the impact of particular factors on the inclusion of children with disabilities. The International Classification of Functioning, Disability and Health (ICF) provides this.

The ICF is a WHO classification system of disability and functioning. It includes a model that demonstrates the interactive relationship between a health condition, contextual factors and the participation of individuals (Figure 2.1). Note that the ICF constructs are denoted by capital letters in this thesis. For example, *Participation* refers to the ICF construct, while *participation* refers to the inclusive outcome.

The ICF represents current international views of health and disability, and as such, offers a global framework with which to examine disability and function (WHO, 2001). It has had a major impact on global health research; in particular, promoting a focus on Participation. The ICF recognises ‘participation in meaningful activities’ as a critical dimension of functioning for people with disabilities (WHO, 2001). Since the publication of the ICF, the disability field has begun to move beyond the purely biomedical perspective of disability, to focus on Participation (Goldstein & Coster, 2004; Hemmingson & Borell, 2002; Kirchner, 2000; Mancini & Coster, 2004; Pivik et al., 2002; Schenker, Coster, & Parush, 2006; Simeonsson et al., 2001; Stewart & Rosenbaum, 2003). The ICF is a recommended framework for childhood disability and vision impairment research (Kirchner, 2000; Stewart & Rosenbaum, 2003).

As mentioned, the concept of Participation is central to the ICF model. It relates to an individual’s involvement in a life situation. ‘Participation in Education’ constitutes a major life area for children, and is the central focus of the current research. The four inclusive outcomes of the thesis are based on this concept.

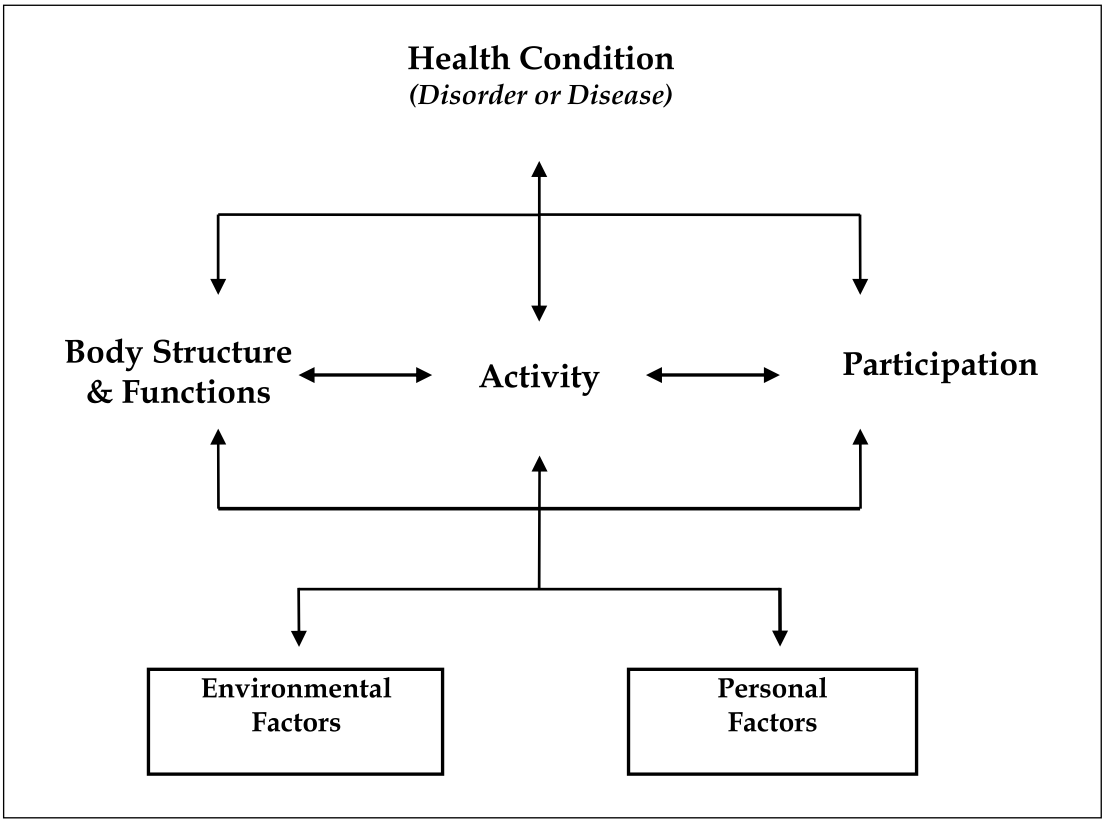


Figure 2.1. International Classification of Functioning, Disability and Health

Note. Figure extracted from WHO (2001, p. 18).

The ICF Health Condition category (see Figure 2.1) refers to vision impairment.

According to the ICF, five components determine the extent of a person's Participation: (1) Body Structures ("anatomical parts of the body"), (2) Body Function ("physiological functions of body systems"), (3) Activity ("the execution of a task or action by an individual"), (4) Personal Factors ("the particular background of an individual's life and living...includes their personal choices, interests and likes and dislikes"), and (5) Environmental Factors ("the physical, social and attitudinal environment in which people live and conduct their lives") (WHO, 2001, p. 12-17). The child, family, and school/class themes evident in earlier research are well represented by the Activity, Personal, and Environmental ICF components respectively.

The ICF conceptualises the Environment not only as a physical construct, but also as the society and people surrounding the person. The Environmental context comprises of 'individual' and 'societal' factors. Individual factors include things in the immediate environment. It includes the direct impact of the attitude or assistance provided by people (e.g. family, peers or teachers) or schools; and features of the physical environment (e.g. the built environment, devices). Societal factors encompass systems and services in the community or society as a whole. It includes laws (e.g. Australian Education Standards), regulations (e.g. education and training policies), organisations (e.g. education and health department systems and services), community agencies (e.g. vision and recreation agency services), and informal social networks.

ICF Activity Factors include the execution of tasks such as self care tasks, interpersonal interactions, focusing attention and the use of devices. The Activity component consists of two qualifiers, ‘performance’ and ‘capacity’. While the capacity qualifier describes an individual’s ability to execute a task at the highest possible level (i.e. in a clinical setting), the performance qualifier describes what a person actually does in their typical environment (WHO, 2001). A child’s performance in a classroom is likely to differ to their capacity in a clinical setting (Stewart & Rosenbaum, 2003). Since children’s outcomes and performance at school were the focus of this study, Activity Performance rather than Activity Capacity was investigated.

Personal factors relate to circumstances and the aspects that make that person unique. They include aspects such as gender, age, upbringing, social background, education, past and current experiences; all of which may play a role in disability at any level (WHO, 2001). Body Function factors are explored in this research, since they include functional impacts of impairment (e.g. quality of vision, intellectual functioning, temperament, and personality functions). However, Body Structures refer to specific anatomical impairments such as impairment of the cornea or retina. Due to the wide variation in anatomical/neurological causes of childhood vision impairment, it was deemed unnecessary to consider the impact of Body Structure factors on inclusion.

The ICF provided a contemporary framework from which to investigate the inclusion of children with vision impairment in regular education. It supports the hypothesis that contextual factors may influence educational outcomes. The next section reviews current knowledge about these factors. The factors are presented in ICF categories.

2.8 FACTORS INFLUENCING INCLUSIVE OUTCOMES

Numerous studies in the education and disability literature have investigated elements that are associated with educational or inclusive outcomes. Most of these examined the effect of individual variables on social or academic performance, resulting in a copious list of factors that potentially influence student outcomes. To review this literature systematically, multivariate studies that addressed inclusive outcomes of children with disabilities or vision impairment (particularly in Australia) between 1986 and 2006 were initially reviewed. The factors generated in these studies then formed the basis for a comprehensive review of literature.

Most studies found were formative (reporting stakeholder perception). This review begins with a brief critique of the stakeholder studies, then of outcome studies. Following this, a comprehensive review of the general literature is presented.

2.8.1 Stakeholder Studies

Nineteen studies elicited stakeholder views about the inclusion of children with disabilities (including vision impairment) in regular classes. Most focused on the factors influencing overall inclusion. Two the studies specifically investigated participation. The studies used qualitative (focus groups, discussion forums, interviews, open questionnaires) or quantitative (questionnaire, ranking) methodologies, and investigated either: (a) the important factors, (b) critical supports, (c) major concerns, or (d) barriers to inclusion as perceived by stakeholders. The studies included three types of stakeholders: (1) ‘mixed stakeholders’ of children with disabilities (parents, educators, therapists, advocates, organisations) including one study about vision impairment; (2) general, experienced and inexperienced teachers of students with disabilities (including one study about vision impairment); or (3) parents of and/or students with vision impairment.

In 14 of the 19 studies, stakeholders were asked to consider all potential factors that may impact on inclusion. Only four of these studies generated Body Function, Activity or Personal Factors. Respectively, these factors were: (a) severity of impairment; (b) emotion, independence and basic skills, and (c) motivation. Stakeholders generated Environmental factors in all studies; with 11 common factors generated (Table 2.3). In particular, the majority of studies emphasised the importance of two environmental factors: (1) teacher training and skill (12 studies) and (2) availability of classroom or school personnel (10 studies, six of which focused specifically on education assistants). Each of the three stakeholder groups (mixed, teacher and parent/student) generated these two factors. However, there were some differences among stakeholder groups. The six *mixed* stakeholder group studies also focused on resources, funding, and parent involvement. The importance of specialists were emphasised in the eight teacher studies. Finally, the five parent/student studies highlighted the importance of: inclusive attitude, teacher training, physical environment, special resources, and curriculum instruction.

The stakeholder studies were broad in scope. The research questions varied and they focused on diverse student populations, including early education, primary school and high school students with disabilities both in Australia and internationally. The parent and student studies (N = 49 - 512) focused on vision impairment, however, they were all qualitative and did not aim to rank the importance of factors. Furthermore, none of the studies compared the views of different stakeholder groups. Finally, some of the studies did not report an explicit definition of inclusion. As such, the participants may have been responding to different aspects of inclusion.

An older study investigated a similar topic to the first phase of this thesis: it identified stakeholder-ranked factors that determine the success of children with vision impairment in integrated [sic] settings (Bishop, 1986). It used a large sample of over 300 US stakeholders (n = 88 visiting teachers, n = 62 regular teachers, n = 52 school principals, n = 56 parents and n = 46 students with vision impairment). However, some key aspects reduced the usefulness of the study. Two research questions were investigated. The first research question was 'double barrelled'; stakeholders (1) generated factors that either *defined* success (responses included academic performance and social interaction) *or determined* success (such as teacher attitude). Since it mixed outcome and independent variables, interpretation of the results is difficult. Furthermore, in the second research question stakeholders (2) rank-ordered factors, that were previously extracted from literature, in terms of their necessity for the success of students who are vision impaired in integrated educational settings.

Table 2.3. Review of stakeholder studies investigating factors, critical supports, concerns and barriers to inclusion, by group type

Author	Sample and research question	Activity	Body Function (severity)	Personal	Environment										
					School/teacher attitude	Teacher training/ skill	Teacher time & stress	Classroom personnel	Specialist input	Support for teacher	Resources / funding	Physical environment & special equipment	Curriculum/ instruction	School structure	Parent involvement
Mixed stakeholders (parents, educators, therapists, advocates and/or organisations)															
Bishop, 1986	*N* = 304 stakeholders VI (US)[a]	√		√	√			√	√			√			√
Crosby, 2002	*N* = 300 disability stakeholders(Australia)[a]		√			√				√	√				√
Llewellyn et al, 2002	*N* = 353 disability stakeholder (Australia)[b]	N/A	N/A	N/A	√			√	√		√				
OECD, 2005	*N* = 28 countries [a]					√		√			√		√	√	√

(table continues)

Table 2.3. ***(continued)***

Author	Sample and research question	Activity	Body Function (severity)	Personal	Environment: School/teacher attitude	Teacher training/ skill	Teacher time & stress	Classroom personnel	Specialist input	Support for teacher	Resources / funding	Physical environment & special equipment	Curriculum/ instruction	School structure	Parent involvement
Loreman & Deppeler, 2000	N = 21 groups (Australia)[a]	N/A	N/A	N/A		√					√				
NSW DET, 2002	136 school visits, 27 public hearings, 760 submissions (Australia)[c]					√		√			√				
Teachers															
Kilgallon & Maloney, 2003	N = 22 general teachers (Australia)[a]				√	√	√	√	√	√					√
Simeonsson et al. 2001	N = 1180 teachers (n = 88 VI) (US)[e]		√		√							√	√		

(table continues)

Table 2.3. ***(continued)***

Author	Sample and research question	Activity	Body Function (severity)	Personal	Environment: School/teacher attitude	Teacher training/ skill	Teacher time & stress	Classroom personnel	Specialist input	Support for teacher	Resources / funding	Physical environment & special equipment	Curriculum/ instruction	School structure	Parent involvement
							Teachers								
Werts, 1996	*n*=116 experienced teachers (US)[b] &	N/A	N/A	N/A		√		√							
	n = 1430 general teachers (US)[b]	N/A	N/A	N/A				√	√						
Wall, 2002	*N* = 96 teachers (Canada)[c]							√	√		√	√			
Wolery, 1995	*N* = 158 US experienced (15% VI)[b]	N/A	N/A	N/A		√	√	√	√	√		√			√

(table continues)

Table 2.3. ***(continued)***

Author	Sample and [research question]	Activity	Body Function (severity)	Personal	Environment										
					School/teacher attitude	Teacher training/ skill	Teacher time & stress	Classroom personnel	Specialist input	Support for teacher	Resources / funding	Physical environment & special equipment	Curriculum/ instruction	School structure	Parent involvement
Monahan et al, 1996	N = 342 regular teachers (US) [d]				√	√									
Brambring, 1992	Regular and VI teachers (US) [a]					√									
Parents and/or students with vision impairment															
Leyser, 2001	N = 130 parents VI (72% < 13yrs)(US) [a]									√					
RBS & BIDBC, 1999	n = 512 parent VI & n = 37 parent & teen interview (Australia)[c]				√	√		√							

(table continues)

Table 2.3. ***(continued)***

Author	Sample and research question	Activity	Body Function (severity)	Personal	Environment: School/teacher attitude	Teacher training/ skill	Teacher time & stress	Classroom personnel	Specialist input	Support for teacher	Resources / funding	Physical environment & special equipment	Curriculum/ instruction	School structure	Parent involvement
Parents and/or students with vision impairment															
Heinze & Leyser, 1998	*N* = 130 parents VI (US)[c]							√							
Ingram, 2004	*n* = 49 parents VI & *n* = 27 adults VI (Australia)[c]					√						√	√		
Leiberman, 2006	*N* = 60 children VI (9-23 yr) (US)[e]		√									√	√		

Note. Studies relate to students with a range of disabilities in regular primary school classes, unless specified.
√ = stakeholders reported as an important / necessary factor for inclusion or major concern regarding inclusion of children with disabilities or vision impairment;
VI = Child with vision impairment; US = United States; Equip = Equipment.
[a] Important factors impacting on inclusion. [b] Critical support required for inclusion. [c] Stakeholder concerns with current inclusion. [d] Barriers to inclusion. [e] Facilitators and barriers to participation.

The stakeholders in Bishop's study were not able to generate factors that they considered relevant. Instead they ranked pre-determined factors. In addition, the results of comparisons among stakeholder groups were not reported. Since this study was conducted during the *integration* movement, rather than the *inclusion* movement, it is questionable whether the findings remain relevant.

Stakeholders have suggested numerous factors as influential to a range of students in various temporal and cultural contexts. However, their relevance to the contemporary Australian context is unknown. Furthermore, while stakeholders have suggested that these factors are important, this cannot be certain until they have been measured.

2.8.2 Outcome Studies

Eight studies in the last two decades tested the influence of multivariate factors on the inclusive outcomes (participation, child interaction, academic or overall) of children with disabilities or vision impairment (Table 2.4), none of which addressed engagement. The studies used case study or correlational design to describe or measure the effect of pre-determined factors.

Five studies investigated the factors that influence the inclusion of children with vision impairment in regular education settings. These addressed a variety of age groups: preschool, primary and high school. Since two of these studies were conducted over 15 years ago, in the early stages of the inclusion movement their applicability to today's context is unknown. One of the vision impairment studies was quantitative (Center et al., 1988). A cross-sectional design measured the correlation between factors and an Academic and Social Integration Index. A small number of children with vision and with hearing impairment were included. The four remaining studies used case study design and multiple data collection methods (including observation of children in their classes). None of the studies used comparison groups, and three of the four studies included very small sample sizes (N = 1 - 6); posing limitations to generalisability. One recent qualitative study investigated the participation of children with vision impairment, using a large sample (n = 17) (Davis & Hopwood, 2002a, 2002b). However, instead of focusing exclusively on inclusion in regular classes, it combined observations from students in

Table 2.4. Factors identified in outcome studies as influential and not influential to inclusive outcomes, by ICF category

		Activity		Body		Personal		Environment														
Author	Design and sample	Social skills	Disability specific skills	Severity disability	Cognition / IQ	Personality	Socio-demographic	Child care/ intervention	School / teacher attitude	Personnel/specialists	Instructional strategies	Teacher skill/knowledge	Assistive equipment	Physical environment	School structure	Curriculum / ECC	Funding / resources	Activity characteristic	Adult input with child	Parent involvement	Family literacy envnmt.	Peers / friendship
								Factors influencing overall inclusion														
Center et al,1988	Quantitative cross-sectional correlation *n* = 8 grade 1 - 6 children sensory disabilities (*n* = 4 VI) (Aus)			x	x				√		$\underline{\surd}$				x		$\underline{\surd}$		$\underline{\surd}$			
Loreman, 2003	Case study & questionnaire *n* = 6 grade 8 - 12 disability (Aus) *n*=43 stakeholders					$\underline{\surd}$			√	√	√	√					√			√		

(table continues)

Table 2.4 ***(continued)***

		Activity		Body		Personal		Environment														
Author	Design and sample	Social skills	Disability specific skills	Severity disability	Cognition / IQ	Personality	Socio-demographic	Child care/ intervention	School / teacher attitude	Personnel/specialists	Instructional strategies	Teacher skill/knowledge	Assistive equipment	Physical environment	School structure	Curriculum / ECC	Funding / resources	Activity characteristic	Adult input with child	Parent involvement	Family literacy envnmt.	Peers / friendship
		Factors influencing participation																				
Davis & Hopwood, 2002a,b	Case studies n =17 VI students in regular class aged 4-12 years (UK)	√	√							√	√	√		√		√						
Simeonsson et al, 2001	Cross-sectional correlation survey N = 1180 teachers (US)			√			√						√		√							
		Factors influencing child interaction																				
Kekelis & Sacks, 1988	Ethnographic, longitudinal N = 6 VI preschoolers (US)	√	√	x					√	√	√	√		(√)			√	√	√			

(table continues)

Table 2.4 ***(continued)***

Author	Design and sample	Activity		Body		Personal			Environment													
		Social skills	Disability specific skills	Severity disability	Cognition / IQ	Personality	Socio-demographic	Child care/ intervention	School / teacher attitude	Personnel/specialists	Instructional strategies	Teacher skill/knowledge	Assistive equipment	Physical environment	School structure	Curriculum / ECC	Funding / resources	Activity characteristic	Adult input with child	Parent involvement	Family literacy envnmt.	Peers / friendship
George & Duquette 2006	Single subject case study *N* = 1 12yr old VI student (Canada)	√			√	√			√		√	√					√		√	√		√
Christian, Morrison, & Bryant, 1998	Cross-sectional correlation (survey) *N* = 538 sighted children pre-kindergarten (US)				√		√														√	
Palmer, 2000b	Case study *N* = 3 VI children (Australia)								√		√		√	√		√						

Note. √ = the factor was identified as a factor influencing inclusive outcomes; (√) = an aspect of the factor was identified as a factor influencing inclusive outcomes; √ = the factor was identified as the most important factor influencing inclusive outcomes; X = the factors was identified as *not* influencing outcomes.
ECC = Expanded Core Curriculum; Aus= Australia.

special classes (n = 6). A broad age range of students were included. Purposive sampling meant that best practice examples were studied. Each participant was observed on six occasions (e.g. one math class), totalling six hours. Interesting cases (n = 6) were further observed and teachers interviewed. Practice features that seemed most significant in removing barriers to participation and learning were: (a) teacher taking ownership of the child, (b) education assistant working with other students, (c) curriculum delivery via non-visual means, (d) participatory teaching methods, (e) clearly adapted teaching materials, and (f) the child's seating position.

One particularly robust study is described. The factors influencing social interactions in kindergarten and first grade were investigated in a qualitative analysis of six children who were legally blind in San Francisco (Kekelis, 1992b). Despite a small sample size, a rigorous methodology attempted to overcome limitations of previous studies. An ethnographic approach collected longitudinal data over a one year period, with weekly observations and interviews with teachers and children to gain sociometric data and verification of observations. A model of 'Factors Affecting Social Inclusion' was developed. Two themes emerged: (1) classroom and teacher, and (2) child factors. The important classroom factors were: organisation of materials, and activity rules. Teacher factors included: supervision, teacher interest and adult support. The child factors included social skills, communication, play and orientation and mobility skills, as well as behaviour problems. Degree of vision loss did not affect children's social inclusion. These factors align with the ICF components of Activity Performance, Body Function and Environment.

Various factors that fit within the ICF components emerged from the outcome and stakeholder studies. While the stakeholder studies tended to focus primarily on Environmental mediators of inclusion, the outcome studies reported many Activity Performance, Body Function and Personal factors. Though the studies varied in quality, they support the premise that a broad range of factors may influence outcomes in regular education. In the next section, the factors identified in these multivariate studies are reviewed in detail. The impact of factors on the inclusive and educational outcomes of students with and without disabilities, and vision impairment is critiqued. The factors are presented according to the ICF categories: Activity Performance, Body Function, Personal, and then Environmental.

2.8.3 Activity Performance Factors Influencing Inclusive Outcomes

Activity Performance describes the execution of a task or action by an individual, in a real life context (WHO, 2001). Relevantly, one study has linked ICF Activity Performance factors with Participation in Education (Mancini & Coster, 2004). Among a large, heterogeneous sample of US primary school children (N = 266, 43% full time regular class) with a variety of disabilities (including 24% vision impairment), Participation in different school settings (rated on the School Functioning Assessment) was predicted by Activity Performance factors. Participation in the regular classroom was predicted by: safety, using materials and positive interaction ($r(266) = .59$, $p < .001$). On the other hand, Participation in the playground was predicted by the following Activity Performance factors: recreational movement, compliance with directions/rules, safety, and behaviour regulation ($r(266) = .68$, $p < .001$). This provides comprehensive evidence that Activity Performance factors influence various inclusive outcomes of children with disabilities, and these may be dependent on the setting.

Among children with vision impairment, it is possible that Expanded Core Curriculum skills, social skills and work-related skills may be important Activity Performance factors. These factors are explored in the following sections.

2.8.3.1 Expanded Core Curriculum

In the vision impairment field, there has been a strong and passionate focus on the importance of the disability specific skills addressed in the ‘Expanded Core Curriculum’. Officially introduced by Hatlen (1996), but taught for many decades prior, the Expanded Core Curriculum has been introduced in schools internationally. It focuses on skills that relate specifically to children with vision impairment: compensatory academic skills (concept development; spatial understanding; listening skills, tactile skills); the use of alternative communication media and technology (e.g. Braille, large print, low vision devices, computers); functional use of low vision; adaptive daily living skills; orientation and mobility skills; recreation and leisure skills; communication and social skills; and career skills (Best, 1992; Gale & Cronin, 1998; Hall Lueck, 1999; Hatlen, 1996; Wolffe et al., 2002). According to experts (Best, 1992; Hall Lueck, 1999; Hatlen, 1996) and stakeholders (Palmer, 2005a), successful academic performance and inclusion of children with vision impairment is based on student's ability to perform these foundation skills. Hatlen adds that Expanded skills also impact on children's wellbeing: "what is known about congenitally blind and visually impaired students is that, unless skills such as orientation and mobility, social interaction and independent living skills are learned, these students are at high risk for lonely, isolated, unproductive lives" (1996, p. 10).

Indeed, some of these Expanded skills have been linked to employment outcomes. Computer skills ($r(167) = .25$, $p < .01$), typing skills ($r(167) = .23$, $p < .05$), and the ability to use public transport ($r(167) = .18$, $p < .05$) were significantly related to employment (Leonard et al., 1999). Furthermore, employers ($N = 22$) have reported that Expanded skills are the key to success in the workforce (Golub, 2006). However, the impact of Expanded skills on inclusive educational outcomes has rarely been tested. It is regularly suggested that there is too little focus on the teaching of the Expanded Core Curriculum in regular schools because of a lack of time, classroom teacher commitment, and understanding (Palmer, 2005a; Wolffe et al., 2002). Similarly, the effect of Expanded Core Curriculum *instruction* on the inclusive outcomes remains unproven.

2.8.3.2 Social skills

One aspect of the Expanded Core Curriculum has received much attention in the disability and vision impairment field – social skills. Social skills may be defined and measured in many ways. While some literature in the vision impairment field focuses primarily on communicative behaviours (e.g. eye gaze, posture); social skills have also been conceptualised as part of a broader construct known as social competence. This includes the ability to demonstrate acceptable behaviours, cognitive problem solving, and self control (Gresham, 1981; McConnell & Odom, 1999). In this thesis, the term 'social skills' refers to the broader definition.

Among typically developing populations, prospective, longitudinal studies with large sample sizes ($N = 76$ - 650) have found that that pro-social skills contribute to school adjustment (Wentzel, 1991, 1993); influence social and academic performance (Alexander, Entwistle, & Dauber, 1993; Cooper & Farran, 1988; Ladd, 1990); and predict grade promotion up to eight years later (Agostin & Bain, 1997; Ferguson et al., 2001). In contrast, impulsive behaviour and aggressive social problem solving predicts conduct problems one year later (Olson & Hoza, 1993).

Strong support also exists in the vision impairment field. Authors strongly argue the necessity of social skills to engage in social encounters with peers, enhance social acceptance, and participate effectively in regular classrooms (Curry & Hatlen, 1988; Gale & Cronin, 1998; Hatlen, 1996). Furthermore, observation of 28 pre-primary students (Erwin, 1993) and an ethnographic study of six children (Kekelis, 1992b) noted that communication and social skills (ability to initiate conversations, maintain conversations and join play groups) were crucial for children with vision impairment to engage in social encounters.

Previous research has compared the social skills of children with vision impairment relative to normative data on standardised assessments (Buhrow et al., 1998; Sharma, Sigafoos, & Carroll, 2000; Telec, 2001). When rated on the Social Skills Rating System, the performance of children with vision impairment (kindergarten to high school) did not differ to the social skill norms (Buhrow et al., 1998). However, on a different instrument, the Behaviour Screening Checklist, 23.8% of children with vision impairment (N = 200 aged 6 - 16 years) exhibited problem behaviours (Sharma et al., 2000). Qualitative reports suggest that while children with vision impairment demonstrate appropriate social skills, others lack social nuances (Palmer, 2005b; Read, 1989). Inappropriate assertion, lower cooperation skills and difficulties with body language have been commonly noted among these children (Buhrow et al., 1998; Erwin et al., 1999; Palmer, 2005b; Read, 1989). Existing studies have included a broad age range of participants (kindergarten through to grade 12), but did not report the results by age group, probably due to small sample sizes (N = 6 – 23). It is difficult to apply these findings directly to young children in early education. Furthermore, social skill development over time is not documented.

It appears that while some children with vision impairment demonstrate inappropriate social skills, others have skills within typical ranges. Strong data in the general education literature suggests that social skills significantly affect educational outcomes. While this has been argued in the vision impairment literature, and observed in qualitative studies, empirical links have not yet been made.

2.8.3.3 Work related skills

'Learning related social skills' may be a component of social skills. It has been suggested that learning related social skills may be comprised of two aspects: interpersonal social skills and work related social skills (Cooper & Farran, 1988). Interpersonal skills include behaviours such as "interacting positively with peers, playing cooperatively and sharing", whereas work-related skills involve the domains of "independence, responsibility, self regulation and cooperation" (e.g. following directions, organising work materials) (Cooper & Farran, 1988, p. 2). These were previously referred to as school readiness skills.

Some research has concluded that work related social skills may be more important than interpersonal skills. Work related skills have predicted the academic success of children without disabilities at kindergarten, school entry, and primary grades (Agostin & Bain, 1997; McClelland, Morrison, & Holmes, 2000). In the Canadian National Longitudinal Survey of Children and Youth (N = 4,302 aged 6 - 11 years), structural equation modelling found a strong positive correlation between work related academic skills (e.g. listens attentively, follows directions, works independently) and teachers' ratings of academic achievement ($r(4{,}302) = .68$, $p < .05$). The sampling design meant that the sample reflected a broad range of social classes, ethnic origins and geographic locations (Ryan & Adams, 1998).

Finally, observation and teacher ratings suggest that they may also be important for kindergarten and school students with disabilities (Carta, Atwater, Schwartz, & Miller, 1990; Kemp & Carter, 2000). There is general support to develop the work related skills of children with disabilities to develop to improve their participation in regular class (Conn-Powers, Ross-Allen, & Helburn, 1990; Orr, 2002; Rule, Fiechtl, & Innocenti, 1990). Indeed guidelines recommend that prerequisite work related skills may assist children with vision impairment to succeed in their first year at school (Gale & Cronin, 1998; Telec, 1998); however this impact has not been tested.

Work related skills have been defined, by some, as a component of social skills. Indeed, strong correlations have been found between work related skills and academic performance in the typically developing population. The influence on inclusive outcomes of children with vision impairment remains undetermined.

2.8.3.4 Summary of Activity Performance factors

Research has explicitly demonstrated that Activity Performance affect the Participation in Education of students with disabilities. The Expanded Core Curriculum for children with vision impairment has been adopted internationally due to the belief that these disability specific skills provide the basis for successful school and life functioning. The actual effect has not been tested. It has been reported that independence skills of children with vision impairment are lower than that of classmates, however there are mixed findings about their level of social skills. Little is documented about children's abilities in the other Expanded skills.

Social skills has emerged from qualitative studies as a significant factor influencing the inclusion of children with vision impairment. Longitudinal studies have demonstrated the strong influence of social skills on the performance of typically developing students. An aspect of social skills, work related skills (or school readiness skills) has gained less favour in recent times. However, teachers believe that these are important skills to enable children with disabilities to independently function in regular classes. Particular skills required by those with disabilities and vision impairment have been described, however, children's baseline functioning and the actual effect of these skills on inclusive outcomes has not been tested.

While studies of typically developing children and those with disabilities have demonstrated the impact of Activity Performance factors on student outcomes, there is much speculation in the childhood vision impairment literature. Strong and sensible arguments do exist, however, solid evidence is required to guide best practice and influence policy decisions.

Next, the Body Function factors influencing inclusion are reviewed.

2.8.4 Body Function Factors Influencing Inclusive Outcomes

Within the ICF model, the construct Body Function refers to the physiological functions of body systems (WHO, 2001). Severity of disability and personality have been suggested as important Body Function factors

2.8.4.1 Severity of disability

The most common body function factor that is addressed widely in the literature is that of the severity of disability. However, this factor demonstrates mixed effects on student performance in education. While some studies report that the more severe the disability, the poorer the social interaction, academic or participation outcomes (Bennet, 2003; K. R. Logan, Bakeman, & Keefe, 1997; Simeonsson et al., 2001), others report no effect (Center et al., 1988; Center, Ward, Ferguson, Conway, & Linfoot, 1989; Kemp & Carter, 2002) (Table 2.4). These differential findings may be expected between studies, since the sample populations (e.g. sensory intellectual or physical impairment) and outcomes varied. However, in two very similar studies that measured the effect of severity of intellectual impairment on the engagement of primary school children (N = 29 - 33), results were also mixed (Kemp & Carter, 2002; K. R. Logan et al., 1997). Uncertainty about the effect of disability severity persists.

There is also uncertainty about the effect of vision impairment severity on student performance and inclusion. Studies have reported positive trends (Brambring, 2001); negative trends (Moonwicha, 2006; Royal Blind Society, 1996); and no effect of impairment level on education. Some research reports that blind school children experienced fewer overall difficulties, but more social difficulties than those with low vision (Royal Blind Society, 1996). Other studies report that preschool children with low vision have greater emotional difficulties (Brambring, 2001). While outcome measures and participant age may have confounded findings, it has been suggested that the clash between sighted and non-sighted worlds may detrimentally affect the emotional or educational performance of children with low vision.

2.8.4.2 Personality

The personality of the child with a disability has been raised as a factor that potentially influences the success of inclusion. In qualitative studies, a 'positive personality' played a role in determining access to, or performance in an inclusive educational setting ($N = 25$) (Hanson et al., 2001). It was even perceived as the most significant factor influencing the success or failure of the inclusion of students with disabilities ($N = 43$) (Loreman, 2003). Similar sentiments have been raised for students with vision impairment (George & Duquette, 2006).

In summary, qualitative studies have indicated that a child's personality may influence inclusive outcomes of students with disabilities. This needs confirmation by further, dedicated research. The effect of impairment severity on the inclusive outcomes of children with vision impairment also requires clarification. Since the majority of children with vision impairment have low vision, knowledge about the differences and similarities to those who are blind is important. This information may influence teacher expectations, preparation, and delivery of educational services to children with low vision. The next section reviewed the effect of Personal factors.

2.8.5 Personal Factors Influencing Inclusive Outcomes

According to the ICF definition, Personal Factors are the "particular background of an individual's life and living, and comprise of features of the individual that are not part of a health condition or health state. It includes their personal choices, interests and likes and dislikes" (WHO, 2001, p. 17). Socio-economic status and early intervention are Personal Factors commonly linked with child performance.

2.8.5.1 Socio-economic status

It is likely that no other individual variable in the social sciences has been so consistently linked to children's school success over the last five decades as socio-economic status. In the Canadian National Longitudinal Survey of Children and Youth, socio-economic status played a powerful and pervasive role, with higher levels of socio-economic status linked directly to higher levels of achievement ($r(4{,}302) = .12$) and academic skills ($r(4{,}302) = .22$) (Ryan & Adams, 1998). Conversely, lower socio-economic status levels have been associated with lower academic outcomes in US ($N = 4{,}423$ three to five year olds) (Zill, Collins, West, &

Hausken, 1995) and Australian population studies (N = 2,737 four to 16 year olds) (Silburn et al., 1996). Similar findings have been reported among typically developing students in kindergarten (Meisels & Liaw, 1993); primary school (Ferguson & Strieb, 1996; Jimerson, Egeland, & Teo, 1999); and secondary school (Ferguson et al., 2001; D. Power & Hyde, 2002). Socio-economic status affects children's work related skills (McClelland et al., 2000), school relevant experiences, and teacher perception of student competence (Tudge, Odero, Hogan, & Etz, 2003).

Families with children with disabilities typically have lower than average household incomes (Bradbury, Norris, & Abello, 2001; Rahi & Cable, 2003). The educational effect of this is less well documented. One study of high school students with hearing impairment (*N* = 747) in regular schools in England questioned the strength of socio-economic status (Powers, 2003). The effect size on exam scores was relatively small (explaining 5% of variance) compared to that reported in the general school literature explanatory, such as 75% variance reported by Gibson and Asthana (1998). These studies measured outcomes differently, which probably reduced the accuracy of comparisons. However, it is possible that the effect of socio-economic status on educational outcomes may be dampened by the presence of a disability.

2.8.5.2 Early intervention

Research to date demonstrated that early intervention leads to clinically relevant, measurable benefits for young children with disabilities, and is now the expected best practice internationally (Guralnick, 1997). Three separate meta-analyses (*N* = 31 - 75 studies of children from birth to five years of age) concluded that early intervention has beneficial but modest effects on young children with disabilities; reporting average effect sizes falling within the range of 0.5 to 0.75 standard deviations (Casto & Mastropieri, 1986; Innocenti & White, 1993; Shonkoff & Hauser-Cram, 1987).

Contrary to expectations, increasing the frequency or intensity of early intervention does not seem to result in better developmental outcomes (Innocenti & White, 1993; Musselman, Wilson, & Lindsay, 1988; M. J. Taylor, White, & Kusmirek, 1993). Instead, a number of studies have instead measured 'age at start of intervention'. But whatever effects are due to the starting age are confounded by the influences from other variables, notably duration of early intervention (i.e. years of intervention)

(Bowe, 2004; Martineau, Lamarche, Marcoux, & Bernard, 2001). Another possible confounding factor on the effectiveness of early intervention is disability severity. Severe disabilities tend to be identified earlier and treatment begun earlier than is the case with mild disabilities (Bowe, 2004; Guralnick, 1997). For this reason, children attending services earlier may have more severe disabilities than those starting later.

Characteristics of early educational intervention have been significantly (though weakly) associated with academic achievement (Martineau et al., 2001). It appears that a low, significant correlation between amount of pre-educational experience (such as child care) and school performance of children *without* disabilities is dependent on socio-economic status (Christian, Morrison, & Bryant, 1998; O'Brien Caughy, DiPietro, & Strobino, 1994). Longitudinal data on disadvantaged children who had participated in the Ypsilanti Perry Preschool Project showed that they had maintained significant gains at age 19 (Berrueta-Clement, Schweinhart, Barnett, Epstein, & Weikart, 1984). These children had higher academic achievement; more of them finished high school; and more went on to postsecondary programs or employment than children who did not attend preschool.

Many disability fields have progressed to linking specific early intervention characteristics with child outcomes. In contrast, there has generally been very little empirical evaluation or developmental data tracking the effects of early intervention on children with vision impairment (Brambring, 1996; Davidson & Harrison, 1997). Research on early intervention efficacy for children with vision impairment rarely has included controls [e.g. seminary research by Frailberg 1974, cited in Davidson & Harrison (1997)], it often has not addressed experimental confounds, and has used very small samples (Klien, Van Hasselt, Terefeiner, Sandstrom, & Ranndt-Snyder, 1988). Nonetheless, anecdotal reports indicate that weekly early intervention of one hour is common practice among children with vision impairment (Chen, 1999a). More recently, early intervention programs report to have demonstrated positive effects on the skills of children with vision impairment. The programs focused on isolated aspects of development, such as mobility (Sonsken, Levitt, & Kitsinger, 1984), communication and social skills (Erwin, 1994), and social responsiveness (Klien et al., 1988). However, intervention data and statistical effects were unreported for these studies.

Two prospective cohort studies have compared the developmental effects of specialised (for children with vision impairment) versus general early intervention programs for matched groups of infants and toddlers with severe vision impairment and blindness. The first was over one year ($N = 58$) (Sonksen, Petrie, & Drew, 1991), and the second over five years ($N = 10$) (Brambring, 1996). The first compared the provision of a combined specialist and general program against the provision of a general program intervention only (Sonksen et al., 1991). Results indicate positive effects sizes for the specialised programs over general, particularly in blindness specific skills, with early introduction to the program yielding the better child outcomes. However, Brambring reported that the specialised intervention had a negative effect for preterm children compared to controls. The authors argued that this was due to the selection effect; the criteria for matched controls gave an unsuccessful match. This study was based on a large aggregate of data, however it was included only on a very small sample size.

In summary, studies have illustrated the effectiveness of early intervention on child development. Characteristics such as frequency of attendance, starting age and disability severity may compound the effectiveness. While increased development may assist children to succeed in regular schools, few studies have demonstrated lasting impact on later schooling success. Although common practice, the effects of early intervention on the inclusion of children with vision impairment is not known.

2.8.5.3 Summary of Personal factors

Solid evidence indicates that Personal factors exert a strong influence on children's education. Socio-economic status is a strong predictor of educational outcomes among the general student population. Early intervention has demonstrated consistent, moderate, positive effects on development of children with disabilities, and limited long term educational outcomes for other students. The benefits may be more closely associated with age of commencement of intervention and the effects may be confounded by severity of disability. Despite this body of knowledge, the effect of Personal factors on the inclusion for children with vision impairment however remains largely unknown.

The final ICF category that will be explored is Environment.

2.8.6 Environmental Factors Influencing Inclusive Outcomes

ICF Environmental factors make up the “physical, social and attitudinal environment in which people live and conduct their lives” (WHO, 2001, p. 16). They may include the child’s family, school or community environment. The Salamanca Statement and the Disability Standards for Education both emphasise the role of the school in adapting to the needs of the child in order to promote inclusion. According to the Salamanca Statement, the development of inclusive schools that cater for a wide range of students requires:

> …clear and forceful policy on inclusion together with adequate financial provision - an effective public information effort to combat prejudice and create informed and positive attitudes - an extensive programme of orientation and staff training - and the provision of necessary support services. Changes in all the following aspects of schooling, as well as many others, are necessary to contribute to the success of inclusive schools: curriculum, buildings, school organisation, pedagogy, assessment, staffing, school ethos and extracurricular activities. (UNESCO,1994, p. 21)

The known effects of these Environmental aspects are reviewed in the next sections.

2.8.6.1 Support and resources

Research that focuses on the range of supports in the inclusive education environment is primarily descriptive, reporting stakeholder views. Two main issues are addressed in such research: (1) stakeholder concerns about unmet need; and (2) stakeholder perception of the supports that impact on inclusion.

In surveys, interviews and public consultation, stakeholders consistently report dissatisfaction with, or a lack of: personnel (particularly education assistants); training and knowledge; funding; materials; and resources and time for planning, to included students with disabilities (Table 2.3). These unmet needs have been raised by special education and regular teachers in early childhood education, primary school and high school internationally (N = 22 - 1430). In a public inquiry in New South Wales, key themes that emerged were: concerns with available resources and funding support, lack of knowledge and skills and insufficient personnel support (DET NSW, 2002). Stakeholders of students with vision impairment in other parts of Australia and the US have expressed similar needs (Blatch, 1990; Leyser & Heinze, 2001). They argue that inadequate resources lead to increased teacher stress and negative attitudes towards inclusion.

According to teachers, these unmet needs are also the supports that are critical for successful inclusion (Crosby, 2002; Kilgallon & Maloney, 2003; Werts, Wolery, Snyder, & Caldwell, 1996). However, a bias could exist in the teacher perception. For example, teachers who have experience in successful inclusion tend to report fewer discrepancies between perceived needs and availability of resources (Wolery, Werts, Caldwell, Snyder, & Lisowski, 1995). Increased supports may promote successful inclusion; however it is also possible that teachers who are more successful require less support to make inclusion work. Similar queries arose when a discrepancy was found in the support that teachers of children with vision impairment assumed they needed when the student enrolled, and their actual support needs 18 months later (Brambring, 2001). This may reflect a difference in perceived and actual support needs, or it may indicate that less experienced teachers have higher support needs. However, an older, correlational study illustrates the importance of supports. Appropriate resource support was the best predictor of integration [sic] success for primary school children with sensory impairment ($N = 8$) (Center et al., 1988). Broadly, supports for inclusion include; personnel, knowledge, skills, training, and resource funding. These are discussed in turn.

One of the main supports for inclusion identified by stakeholders is personnel; specifically, education assistants (see glossary) (Chadbourne, 1997; Forlin, 1995; Kilgallon & Maloney, 2003; Wall, 2002). A descriptive study ($N = 96$) found that 20% of teachers of children with low vision and 33% of those who had taught a student who was blind in Canada cited the unavailability of an education assistant as their major concern (Wall, 2002). Similar to other countries (Mueller & Murphy, 2001), there is evidence that Australian teachers and schools rely heavily on the support of education assistants (more-so than teacher planning time or specialised staff) (Kilgallon & Maloney, 2003; Van Kraayenoord & Elkins, 2000). For example, 95% of the 2001 New South Wales Department of Education 'Funding Support' was spent on special education assistants (DET NSW, 2002).

According to the ABS, 32% of students with a sensory or physical disorder in 1998 received support from an extra assistant (ABS, 2000). The role of assistants working with students with vision impairment is broad. They prepare materials (Braille, large print tactile); instruct students (under teacher supervision); reinforce developmental skills; assist in self-care routines; provide visual descriptors; and generally assisting the student to achieve maximum independence and inclusion (Giangreco, Edelman, Broer, & Doyle, 2001; Russotti & Shaw, 2001). It is typically recommended that education assistants work with all students in the class rather than only the student with a disability (A. Logan, 2006). However, this does not always occur in practice. Many studies have commented on the ‘role confusion’ among education assistants, with many taking on or being assigned primary responsibility for implementing or making curricular and instructional decisions (Giangreco, Edelman, Luiselli, & MacFarland, 1997; Kilgallon & Maloney, 2003; Marks, Schrader, & Levine, 1999).

The increased reliance on education assistant supports has not been matched by systematic, data-based examinations, and it is difficult to determine whether their deployment is effective in promoting inclusive outcomes (Forster & Holbrook, 2005). Two Australian studies, a case study of children with learning disabilities (N = 2 grades 6 - 8) (Sutherland, 2001) and an older mixed methodology study (case study/correlation of children with disabilities N = 43 grade 1 - 6 students) (Center et al., 1988), both argued that the teachers’ guidance and appropriate deployment of education assistants may be essential to the positive inclusion. Evidence indicates that education assistants are often not appropriately deployed, and while they may help to realise individual education or developmental objectives, they can have an adverse effect on children’s inclusive outcomes (Mueller & Murphy, 2001). In particular, proximity of the assistant to the child appears to be a major concern. Qualitative studies of students who are deaf-blind (N = 11) (Giangreco et al., 1997), those with autism (N = 3) (Alston & Kilham, 2004), and vision impairment (N = 17) (Davis & Hopwood, 2002a) observed that the close presence of an assistant separated or isolated students from groups, and interfered with social interactions, independent work and engagement in tasks. However, a multiple single-subject study of children with autism (N = 3, M = 8.5 years) was unable to determine an association between proximity of the education assistant and on-task behaviour (Young, 1997). Despite this, authors warn that the *overly* helpful attitude of assistants may lead to an overdependence among students with vision impairment (S. Lewis & Allman, 2000).

Rather than relying solely on untrained workers, teachers have agreed that professional teaching qualification is a prerequisite for providing direct and ongoing literacy instruction for students with vision impairment. Delphi surveys recommend that high quality instruction and a sufficient amount of time by a Visiting Teacher of vision impairment is critical for successful literacy outcomes (particularly Braille) (A. L. Corn & Koenig, 2002; Koenig & Farrenkopf, 1997; Koenig & Holbrook, 2000a). However, the lack of teachers in Australia who are literate and skilled in teaching Braille may restrict student's access (timeliness, quality and quantity) to literacy instruction in regular schools (Ingram, 2004; J. Power & Angela, 2006).

Furthermore, it has been argued that teachers' general skills in inclusion strongly influence the quality of inclusive education they are able to provide. However, stakeholders report that teachers lack these skills (and training). Surprisingly, a lack of teacher skills and training was identified as the main barrier to equity and inclusive education among OECD countries that have been practicing inclusion for many years (OECD, 2005,Brambring, 2001). Australian teachers support these findings (Crosby, 2002; Epstein-Frisch, 2000).

These findings appear to apply to all levels of pre-service and in-service training. Disturbingly, there is a lack of consistency in pre-service teacher education across Australia (Forlin, 2006). A review of 73 pre-service training courses offered by 16 Australian universities in 2002 reported that only 46% included a compulsory unit in inclusive or special education, with a further 12% offering elective units (Loreman, Deppeler, & Harvey, 2005). While some courses now build inclusive concepts into courses, it appears that these findings have not changed significantly in recent years (Curtin University of Technology, 2007; Monash University, 2007; University of Melbourne, 2007; University of South Australia, 2007; Victoria University, 2008). A significant number of stakeholders, including newly graduated teachers, continue to report that dissatisfaction with teacher pre-service and ongoing training (Cambourne, 2002; Crosby, 2002; Epstein-Frisch, 2000; Kilgallon & Maloney, 2003; Loreman & Deppeler, 2000). Some teachers feel that they lack the necessary competencies to include children or solve problems they encounter with students with disabilities. As a result often, some teachers engage in practices that are not of direct benefit to students.

Vision impairment issues are generally addressed as a small component of special education units, if at all. Most teaching staff in Australia attend at least one introductory professional development session about vision impairment if they have a student with vision impairment in their class. Specialised vision departments of the education bodies in the various states offer up to nine formal professional development sessions per year for teaching staff (DET WA, 2006; DET Tasmania, 2007; Statewide Vision Resource Centre, 2007).

Another important element to consider is the effect of experience with inclusion on teacher’s ability to include children with disabilities. Results are inconclusive. In two Australian studies, teachers in their first few years of teaching were more positive towards inclusion than those with more experience (Center & Ward, 1987; Forlin, 1995), however other studies did not find any attitude difference among experience levels (Jobe, Rust, & Brissie, 1996; Larrivee, 1981). In the vision impairment literature, previous exposure to children with vision impairment has been linked to greater teacher confidence and attitude towards including students (Wall, 2002). Current evidence does not conclusively link teacher training, skill, or experience to the inclusive outcomes of children with disabilities.

Central to the provision of supports and resources is the issue of funding. Stakeholder groups have raised the issue of funding as the critical component to underpin quality education for children with disabilities (Crosby, 2002; Llewellyn et al., 2002; OECD, 2005). Funding can provide access to personnel, resources and equipment. In Australia there are differences among funding arrangements available to government, private and independent schools. The Association of Independent Schools Australia [AISA] argue that students with disabilities who attend independent schools receive less than the minimum level of funding received by students attending government schools, which restricts placement options and available resources (AISA,2005). It is unknown whether the type of school and funding affects inclusive outcomes.

In summary, teachers internationally report inadequate levels of support, training, skills, and personnel to implement inclusion. It is possible that the recent changes in Australia (increased legislative emphasis on inclusion, increased funding and professional development in some states) may see an improvement in the supports and resources available to teachers in the near future. Such changes have not been reported yet. The adequacy of the supports provided to teachers of students with vision impairment and their effect on inclusive outcomes requires investigation.

2.8.6.2 Inclusive attitudes

The attitude of teachers and principals towards inclusion is said to affect the inclusion of students with disabilities in regular education. Stakeholders of children with disabilities (Chadbourne, 1997; Epstein-Frisch, 2000; Hemmingson & Borell, 2002; Monahan, Marino, & Miller, 1996) and vision impairment consistently emphasise its importance (Bishop, 1986; Center et al., 1988; Llewellyn et al., 2002; Simeonsson et al., 2001; UNESCO, 1994; Wall, 2002). In descriptive studies (N = 1 - 130) parents have reported that the negative attitude of some teachers towards their child reduced the children's general inclusion (Heinze & Leyser, 1998); participation in activities; use of adaptive equipment; and increased instances of peer rejection (RBS & RIDBC, 1999, D. Barton, 1997).

On the other hand, empirical studies have reported mixed findings. Three Australian cross-sectional studies reported positive relationships between school ethos or attitude of teacher and inclusive success (Bennet, 2003; Center et al., 1989; Loreman, 2003). For example, structural equation modelling found a moderate, positive relationship ($r(212) = .49$, $p < .05$) between teacher rated *Attitudes Towards Mainstreaming* scores and the social competence of primary school children with physical disabilities (Bennet, 2003). The direction of these relationships cannot be deduced by the design: it is possible that positive teacher attitudes resulted from, rather than caused of effective inclusion. Additional studies have found negligible relationships (Hudson & Clunies-Ross, 1984; Roberts & Zubrick, 1992).

Over time, there has been an improvement in teacher support for the ideology of inclusion, but teacher practices still do not always reflect espoused beliefs (Forlin, 2006). Although the effect of teacher attitude is inconclusive, children with vision impairment may face barriers to being included by their teacher. Over the past two decades, teachers (*N* = 96 - 2551) in Australia, Canada and the US have consistently reported negative attitudes towards the inclusion of students who are blind; and an ‘uncertainty’ towards children with moderate vision impairment (Center & Ward, 1987; Horne, 1983; Wall, 2002). They reported less anxiety towards including students with low vision. While this is concerning, it has been argued that teacher attitude toward an *individual* student may be more influential than their general attitude toward inclusion (Roberts & Zubrick, 1992).

Others have argued that principal attitude may be more influential than teacher attitude. Principals have a strong influence on the overall atmosphere of the school and thus may impact on inclusive practices (Erwin, 1991; Gale & Cronin, 1998). This premise is supported in an ethnographic study of a Victorian student with vision impairment, which concluded “for the student with a vision impairment to be fully included in the school, it is critical to have the unequivocal support of the principal, since the ultimate success of specific programs within a school community will be dependent on the principal's involvement and encouragement” (R. Sinclair, 1991, p. 152). The literature has shown that differences do exist in principal and teacher attitudes, with principals generally having a more positive attitude towards inclusion (Center & Ward, 1987; Forlin, 1995). It is not clear if one staff member has more effect on student outcome than the other.

Finally, evidence of the effect experience or training on teacher or principals attitude towards inclusion is inconclusive. Positive (Praisner, 2003; Wall, 2002), negative (Soodak, Podell, & Lehman, 1998), or no effect have been reported (Barnett & Monda-Amaya, 1998; Lanier & Lanier, 1996). It may well be that only positive experiences have a positive influence on attitude (Praisner, 2003), or that experience is positive for principals but negative for teachers (Forlin, 1995).

The effect of inclusive attitude on the inclusion of students with disabilities is inconclusive. Profession, individual children, training or prior experience may vary the impact. Internationally, reports of teacher attitudes vary dramatically. Research is required to assess the inclusive attitude of Australian educators, and the effect of this on the inclusive outcomes of children with vision impairment.

2.8.6.3 Differentiation

The overarching teaching strategy that is designed to include children with varied abilities in classroom activities is termed 'differentiation'. Differentiation is an educational strategy used to teach the same standard to a range of learners by employing a variety of teaching and learning modes (Tomlinson, 2000). It includes instruction and processes that take into account varied learning styles and respond to individual student needs, thereby providing an appropriate level of challenge and support (Heacox, 2002; Rief & Heimburge, 2006). Strategies include tiered tasks and activities (or multi-level curriculum), flexible student groupings, adult support/scaffolding and multi-sensory instruction.

In the vision impairment literature, differentiation of instruction and processes have been described in opinion based literature, however few studies have linked the practices to student outcomes. Following a review of educational literature and case studies of three children with vision impairment, it was concluded that differentiated teaching approaches such as: experiential and language centred learning, cooperative learning and shared activities, modelling and constructivist approaches to numeracy were commonly used (Palmer, 2000a). No investigation followed to determine the effectiveness of either approach. However, two studies utilising naturalistic observation showed that an aspect of differentiation (appropriate structuring of activities and daily routines) potentially influenced the success of children with vision impairment (Brambring, 2001; Kekelis & Sacks, 1988). Participation and child interaction was influenced by: activity type, location, and the number of children in the group.

Flexible grouping is another component of differentiation, in which group types (whole class, small group or individual) are selected to meet the purpose of an educational activity (Rief & Heimburge, 2006; Tomlinson, 2001). The effect of group type on the engagement of students with and without intellectual impairment has been tested in four correlational studies (Bronson, Tivnan, & Seppanen, 1995; Kemp & Carter, 2002; K. R. Logan et al., 1997; McWilliam & Bailey, 1995). Although the studies used different measurements of engagement (e.g. Bronson Social and Task Skills Profile, Observing Pupils and Teachers in Classrooms Assessment, percentage of time spent in active engagement) they all reported that whole group instruction had a negative impact on engagement. One-to-one instruction (engagement M = 43%, SD = 18%), small group instruction (M = 42%, SD = 20%) and independent work (M = 50%, SD = 18%) appear to be more facilitating contexts than whole class instruction (M = 23%, SD = 19%) (K. R. Logan et al., 1997). For preschool children with vision impairment, teachers (N = 72) reported that students experienced fewer problems with activities in adult directed groups and adult interactions (e.g. sing-along games, morning groups = 0% problems) when compared with individual activities (e.g. handicrafts = 63% problems; cognitive play/puzzles = 48% problems) (Brambring, 2001).

One differentiated technique in particular; 'cooperative learning' has been supported by a vast amount of research as a beneficial classroom structure. It involves small group activities that are constructed to rely on inter-dependence among children for successful completion (Johnson, Johnson, & Holubec, 1998). Cooperative learning has demonstrated a positive correlation with goal attainment (Johnson et al., 1998; Rief & Heimburge, 2006). Cooperative learning strategies have gained some attention in the vision impairment literature. A pre-test post-test study demonstrated that cooperative learning strategies can increase the social interaction of preschoolers with vision impairment (n = 13) to rates comparable to sighted classmates (61% vs. 67% respectively) (D'Allura, 2002). More-over, research found that in the self-contained class that did not use cooperative learning strategies, children with vision impairment (n = 5) continued to interact mostly with adults. However, due to the sampling process the difference in interaction may have been due to confounding factors (i.e. lack of sighted children in the self-contained class, and placement type) rather than the learning strategy itself.

Further to cooperative learning, the implementation of 'trained peer' strategies have proven effective in increasing the social interaction and engagement of children with disabilities in regular classrooms. Single subject designs have consistently demonstrated the effectiveness of trained peer strategies in increasing the social interaction, among preschoolers with: mild developmental delay (N = 8) in regular classrooms (Storey, Smith, & Strain, 1993) and autism in clinical settings (N = 5) (Odom & Strain, 1986). It has effectively increased social interaction of high school students with severe physical and intellectual disabilities (N = 3) (Shukla et al., 1999) and vision impairment ($N = 5$) (Peavey & Leff, 2002). Peer tutor strategies have also improved the engagement of students with vision impairment ($N = 4$ grades 3-11) in physical education; as documented in a multiple single subjects study with baseline-intervention design (Wiskochil, Lieberman, Houtson-Wilson, & Peterson, 2007).

Finally, the instruction and scaffolding provided by teachers to appropriately support and challenge student's individual learning needs is yet another aspect of differentiation. Some concerns exist about the appropriateness of support provided to students with disabilities. While the amount of adult involvement has been linked with higher engagement ($R(586) = .31$, $p < .05$) in some primary school children (Bronson et al., 1995), another study of young children ($n = 16$ aged one to four years) reported that adult involvement decreased peer interaction, as rated by the Engagement Check (McWilliam & Bailey, 1995). The impact of education assistant involvement (see section 2.8.6.1) and teacher involvement has been illustrated in vision impairment research. Four case studies of children with vision impairment in preschool and kindergarten ($N = 1 - 6$) have observed that the balance of responsive and non-intrusive adult support can improve social interaction, participation in social and academic tasks, and engagement in activities (Erwin et al., 1999; Kekelis, 1992a; Kekelis & Sacks, 1988; Taylor-Hershel & Webster, 1983). On the contrary, when too much supervision was provided, failures in social and academic activities were observed (Kekelis & Sacks, 1988). Similar findings have been reported in quantitative studies of preschool children who are blind ($N = 4 – 18$) (Crocker & Orr, 1996; Workman, 1986). Commonly useful strategies include: modelling, cueing, description of the social environment, direct and indirect prompts.

In summary, various methods of differentiation exist to include children with vision impairment in regular classes. The group type selected has an impact on engagement, with whole class instruction appearing to have a negative impact. Cooperative learning strategies and peer tutoring also appear effective in increasing social interaction. A balance of adult involvement may be required to promote overall inclusion. Numerous guidelines describe these strategies (Best, 1992; Erwin, 1991; Gale & Cronin, 1998; Griffin, Williams, Davis, & Engleman, 2002), however research has not evaluated the extent to which teachers actually implement these strategies in practice.

2.8.6.4 Physical environment

Research provides some evidence that physical environmental modifications increase access to learning and improve inclusive outcomes of children with disabilities. Three studies indicate the impact of the physical environment (Soukup et al., 2007) and equipment accommodations (Cox, Herner, Demczyk, & Nieberding, 2006; Simeonsson et al., 2001) on student participation. For example, physical classroom arrangement and classroom setting, in addition to instructional grouping, accounted for 52% of within-student variance in access to the general curriculum of primary school students with intellectual disabilities (N = 19, M = 10.6 years, rated by 114 observation minutes using Access CISSAR measurement) (Soukup et al., 2007). Furthermore, a larger retrospective, correlational study of education data in 50 US states found that the amount of equipment accommodations used correlated with lower discipline rates ($r(50) = .429$, $p < .01$), and greater participation in state-wide reading ($r(18) = .526$, $p < .05$) and mathematics ($r(18) = .60$, $p < .01$) assessments for primary school students with disabilities (Cox et al., 2006). However, given the nature of the research design, it is not possible to conclude a cause-effect relationship.

In the vision impairment field, an expanse of professional literature describes the physical features of the indoor and outdoor environment that improve access to the curriculum. These include lighting, contrast, magnification, tactile and audio features, optical and non-optical devices (Arter, Mason, McCall, McLinden, & Stone, 1999; Best, 1992; Chen, 1999b; Douglas, 2001; Fellenius, 1999; Griffin et al., 2002; Mayfield, McCormick, & Cook, 1996; Pagliano, 2002; Palmer, 2000a). Some studies support the premise that accessible materials and environment contribute to access to academic performance (Smith, Geruschat, & Huebner, 2004); participation (Davis & Hopwood, 2002a; Leiberman et al., 2006); and social interaction (Cooper & Nichols, 2007; Kekelis, 1992b). Only one of these studies considered the physical environment as a whole: an ethnographic case study of one preschool child (Kekelis, 1992a). Generally, outdoor settings did not support social interaction with peers; however, the creation of a safe and predictable environment did.

Other studies focus on the effects of specialised devices for children with vision impairment. Parents believe that restricted access to appropriate equipment restricts access to the general curriculum (Ingram, 2004; Smith et al., 2004) and increases student workload (RBS & RIDBC, 1999). Indeed, appropriate optical and non-optical aids and equipment may well increase the participation and socialisation of children in early education (Cooper & Nichols, 2007) and improve literacy performance (A. L. Corn, 1990). A repeated measures study demonstrated this. The implementation of an electronic Braille device (including training) with kindergarten to grade 2 children with vision impairment (N = 20, M = 5.8 years) was evaluated (Cooper & Nichols, 2007). Of the students who were assessed (n = 10), 70% had literacy improvement on the Texas Primary Reading Inventory post-test at the end of the year; and 30% had no change or lower scores. Unfortunately, this quantitative phase lacked rigour. The inconsistent pre and post-test assessment, lack of comparison group and the existence of confounding variables (i.e. change in student seating arrangement; training, support and feedback provided to teachers) limited the reliability of results. Still, qualitative feedback and observations noted positive impacts on student literacy, interaction with the general class teacher, participation in general education activities and social interaction with peers.

Some research has highlighted serious problems in the provision and implementation of specialised equipment for students with vision impairment. There is a perception that (unlike large print) the very equipment that promotes access acts as a barrier to social interaction by highlighting differences among students (Hatlen, 2004). This has been reported by regular teachers (Gasparetto, Temporini, Montilha, Nobre, & José, 2006; Smith et al., 2004), students (A. L. Corn, 1990) and parents (Ingram, 2004). In focus groups parents (n = 49) and young legally blind adults (n = 27) have described how ‘clunky’ resources on the desk in the classroom impacted on opportunities to interact with classmates and led to exclusion from peer groups (Ingram, 2004). These perceptions have been reported more-so by older children (A. L. Corn, 1990). As such, despite consistent findings that optical aides (as opposed to large print) increases reading speeds among students with low vision (Caspe, Lopez, & Wolos, 2007; A. L. Corn, 1990; A. L. Corn & Koenig, 2002; A.L. Corn et al., 2002; Naomi & Tyagi, 2007), many children do not use recommended optical devices (Gasparetto et al., 2006).

Added to this problem, teachers have indicated a preference for large print over prescribed optical aides (Smith et al., 2004). Teachers report that they are ill-prepared to use low vision devices. They are unfamiliar with the way to use the equipment and the kinds of activities the devices would be useful for (Gasparetto et al., 2006). As a result, children with low vision may not access to the general education curriculum at the same time as peers, nor receive it in the least restrictive format.

The timely access to and training in the use of specialised equipment may be another important factor. Loan pools exist and there is often a waiting list for such equipment in Australian schools (Association of Independent Schools of Victoria, 2005). Specialised Braille and copyright protected large print resources are produced or borrowed for the student by relevant education or vision organisations in Australia (Commonwealth of Australia, 2003; DET WA, 2006; Queensland Braille Writing Association Inc., 2008). Similar waiting lists exist for production (Australian Blindness Forum, 2002). Experts have reached a consensus about the amount and intensity of training that students need to competently use vision devices (A. L. Corn & Koenig, 2002). However, the extent of training actually implemented, and the overall adequacy of specialised vision equipment in Australian classes remains unknown.

In summary, the literature suggests that modifications increase the performance of students with disabilities. Clinical guidelines specify how the environment should be arranged for students with vision impairment. Conclusive evidence exists for the benefits of optical equipment on literacy performance, but there is some concern that these devices are not adequately utilised. There is an indication that the environment as a whole may be structured in such a way as to increase the quality of inclusion. Confirmation is required and the adequacy of typical class environment is unknown.

2.8.6.5 Parent involvement and family literacy environment

A sound research base attests to the many benefits of parental involvement in education. For the past two decades, large, prospective, longitudinal studies have demonstrated that parent involvement in early education (Miedel & Reynolds, 1999; Parker et al., 1997) and primary school (Caspe et al., 2007) effects school readiness and social competence (Parker et al., 1997); has long term effects on academic achievement (Eccles & Harold, 1996; Epstein, 1983; Grolnick & Sloweaczek, 1994); and promotes a sense of efficacy for succeeding at school (Hoover-Dempsey & Sandler, 1995). In a retrospective study, after controlling for family background, the number of activities in which parents participated in preschool and kindergarten was significantly associated with higher kindergarten ($B(704) = .60$, $p < .05$) and eighth grade reading achievement ($B(704) = 1.26$, $p < .01$); as well as lower rates of grade retention in eighth grade (Miedel & Reynolds, 1999).

However, it has been argued that the effect of parental involvement depends on the particular characteristics of the parent and their involvement, including: socio-economic status, reason for involvement, type of involvement, and quality versus quantity of involvement (Dearing, Kreider, Simpkins, & Weiss, 1998; Nadon & Normandeau, 1997). A meta-analysis ($N = 21$ studies during 1992-9) found positive effect sizes of parent involvement on academic achievement (effect size 0.01 - 0.74), but a varied effect among different ethnic groups depending on type of involvement (parental style, attending, expectations or rules) (Jeynes, 2003). In addition, interaction effects of socio-economic status on parental involvement have been reported for primary school literacy performance [coefficient -.13, $SD = .04$, $t(261) = -3.01$, $p < .01$] (Dearing et al., 1998), academic success and behaviour outcomes. For example, while parental involvement in low income families leads to improved student performance and fewer problem behaviours; however parent involvement in high income families has a negligible educational effect or is associated with *increased* behaviour problems ($N = 1445$) (Domina, 2005). Differing parental reasons for becoming involved in education may explain the mixed student outcomes (Hoover-Dempsey & Sandler, 1997).

Few empirical studies were found to address the effect of parent involvement on the educational outcomes of children with disabilities. In one cross-sectional study of 212 Australian families, family functioning factors such as family conflict, enmeshment and external locus of control had more influence on social outcomes than parental involvement. A qualitative study from a Vermont school district which serviced 3,500 students suggested that highly involved or highly assertive parents of children with disabilities may influence their child's educational program (Mueller & Murphy, 2001). Parents who viewed success as achieving academically tended to communicate this to education assistants who modified the program accordingly. Other parents tended to demand the maximum coverage by adults for their children, thus reducing natural peer support. While it has been argued that parental involvement is important for children with vision impairment (Milian, 2000), the effect of type of involvement or involvement among socio-economic status levels has not been investigated.

Finally, the family literacy environment (the prevalence of reading and writing material in the home and emphasis on early literacy) has also been purported as an influencing factor on later literacy and academic performance among the general population (Christian et al., 1998; Sénéchal & LeFevre, 2002). This has also been suggested in the vision impairment literature (Craig, 1996, 1999; Crespo, 1990). However, these studies found that the more severe the vision impairment, the lower the parental emphasis on home literacy environment (e.g. lack of Braille writers, tactile books). Children with more severe vision impairment may be placed at a further disadvantage due to these limited early literacy experience.

In summary, years of longitudinal research has attested to the positive influence that parental school and home involvement can have on educational and behavioural outcomes of children. However, it appears that the characteristics of this involvement can dramatically alter the benefits or detriment to the student. Less is known about the level and effect of parental involvement among those with children with disabilities. Conflicting evidence exists in the few studies, and comparisons have not been made with typically developing populations. Furthermore, evidence identifies that children with vision impairment are at risk due to restricted early literacy experiences; however the later effects in education have not been tested.

2.8.6.6 Summary of Environmental factors

There is a strong literature focus on Environmental factors associated with inclusion. Many of the factors are thought to not only affect the inclusive experience of students, but also the teacher and staff experience, in terms of stress, effort required, confidence and ability to include students with disabilities. The support and resources currently provided to classroom teachers is a major concern identified in the literature. Stakeholders perceive that personnel, teacher qualifications, skills, training and funding are inadequate, and as such, reduce the quality of the educational experience afforded to students. Some believe that inadequate classroom support results in a negative attitude teacher towards inclusion, which in turn restricts the educational experience of students. However, these concerns have not been thoroughly tested.

Numerous strategies exist to make the regular curriculum accessible and meaningful for children with wide ranging abilities, including differentiation of instruction and programming, physical modifications, assistive devices, and parental involvement. The extent to which these strategies are actually implemented in classrooms has not been determined. Furthermore, it remains unknown whether these strategies have a substantial impact on the performance and inclusive outcomes of students with disabilities, including those with vision impairment.

2.8.7 Summary of Contextual Factors and their Influence on Outcomes

The potentially influencing factors have been examined in isolation in this review. However, there is substantial evidence that the accumulation and interaction or risk factors and facilitating factors ultimately determines child outcomes (Marshall & Watt, 1999; Rutter, 1985). Rich research exists in the general education, physical and intellectual disability literature; however, research about students with vision impairment is limited. Research has described the regular class context in which children with vision impairment are educated; however, few studies have evaluated it. Phenomenological research and case studies have described the aspects of the educational environment (including adult and peer involvement, activities, physical environment, monitoring, instructional strategies). While recommendations exist for classroom modifications, the studies have not determined the adequacy of the contexts, nor did they compare these among settings or against sighted children.

Stakeholders have identified Environmental, Activity Performance, Body Function and Personal factors that impact on the success of children with disabilities and vision impairment in regular education. However, only a few studies have actually tested the impact that these factors have upon the social and academic performance of children with vision impairment. These studies included very small sample size and most were of case study design. Among these studies, teacher attitude and aspects of individualised curriculum, and adult involvement were commonly reported to influence children's performance.

In addition to these primary studies, research has investigated the effect of individual variables on the success of children with vision impairment. In particular, quantitative research has investigated the effect of specialised vision aides and equipment on aspects of education. In pre and post-tests, optical devices have been demonstrated to increase literacy speed and comprehension, while Braille devices with audio functions have been implemented in such a way to increase participation and socialisation. In addition, the input from adults has been observed as both a barrier and facilitator of social interaction and participation in academic activities, depending on proximity and appropriateness of input. Numerous guidelines infer that the physical environment and special instruction strategies promote the performance of children with vision impairment. The limited qualitative and quantitative studies that do exist have provided conflicting evidence. In addition, cooperative learning strategies were demonstrated effective in a pre-post design but the effects of other individualised curricular practices have not been tested. Similarly the effect of staff support, teacher training and experience, parental involvement, teacher attitude, school attitude or early intervention on educational outcomes of children with vision impairment have not been tested.

Opinions and perspectives have been voiced by stakeholders and experts alike, however gaps are evident in the childhood vision impairment literature. Specifically, there is a lack of solid evidence that (1) describes the situation that children with vision impairment face in early education settings, and (2) identifies the factors that affect inclusive outcomes of children with vision impairment in regular settings. One reason for this lack of evidence is the methodological impact of childhood vision impairment on research. The following section reviews these issues.

2.9 METHODOLOGICAL IMPACT OF CHILDHOOD VISION IMPAIRMENT

Methodological issues arising from the characteristics of children with vision impairment have impacted on the ability to conduct high level research. As such, although many factors are commonly reported in the vision impairment or inclusive education literature, their impact on the performance of children with vision impairment has not yet been determined. The methodological issues thwarting the field are described below.

Compared to other research fields, relatively few experimental studies have been conducted in the field of childhood vision impairment. This is due primarily to the low incidence of childhood vision impairment. Quantitative studies that do exist tend to contain very small samples sizes; between eight to 18 participants (Center et al., 1989; Troster & Brambring, 1994). Sample size difficulties have been compounded with the move from institutional to local school education spreading the student population further geographically (Erwin, 1991; Rahi, Manaras, Tuomainen, & Lewando Hundt, 2004). In addition, the increased pressures of inclusion reported by classroom teachers may well have deepened a reluctance to participate in research. As such, there has been a focus on low levels of evidence such as opinion-based information, practice-based guidelines and qualitative research. While expert opinion is based on a wealth of clinical experience, the accuracy and trustworthiness of the data cannot be established (NHRMC, 1999; The Joanna Briggs Institute, 2006). Sound qualitative data are extremely valuable in describing the phenomena of how students with vision impairment function in the school environment or in developing new theories and intervention strategies to promote competence (Erwin, 1991). However, quantitative research is also required to examine some of the fundamental issues surrounding the inclusion of children with vision impairment, such as comparing outcomes with sighted peers and confirming the effect of critical elements on success. The presence of a comparison group is also critical to determine whether outcomes among children with vision impairment are within expected ranges (Dawson & Trapp, 2001).

Furthermore, the severity and functional impact of vision impairment varies dramatically between individuals. Some of the research on students with vision impairment neglects to adequately define the degree of visual impairment in the sample, or use comparable terms, such as the WHO guidelines (Bishop, 1986). The relatively high prevalence of low vision compared to blindness provides impetus for research to focus on children with low vision.

Previous research has sought to focus solely on vision impairment. However, in the developed world, a high proportion of children with vision impairment have co-existing disabilities. As such, there is a considerable need for research frameworks to study childhood vision impairment within the context of multiple disabilities. Experts have warned that any research applied to children with only vision impairment faces the risk of becoming irrelevant (Warren, 2000).

When designing research in childhood vision impairment, the methodology needs to reflect cognisance of variation among the relatively small population of children with vision impairment. Analysis of group differences based on impairment *alone* (i.e. vision impairment vs. no vision impairment) may miss information (Kirchner, 2000; Warren, 2000). As such, within-group variation (variation among children with vision impairment) needs to be explored with novel methodology. Finally, longitudinal research may help to address the issue of individual differences by monitoring change over time and relative achievement of developmental milestones (Portney & Watkins, 2000). However, relatively few longitudinal studies exist in the childhood vision impairment field, possibly due to fiscal or human resource restrictions.

The methodological issues have restricted the design, sampling and analysis of previous childhood vision impairment research. In turn, this limits the generalisability and reliability of many previous studies. In the age of evidence based practice, outcomes based funding, and in the name of best practice for children with vision impairment, a solid and empirical base of evidence is required to question, test and justify long held assumptions, practices and interventions. In order to do so, a novel methodology that addresses the characteristics and needs of the population is required.

2.10 CONCLUSION

This literature review has indicated that the inclusion movement has dramatically and suddenly placed high demand on regular schools and classroom teachers. Concerns still exist regarding the capacity of schools to properly resource and support inclusion. While inclusion has rarely been shown to have negative effects on student or classmate outcomes, there are concerns about the quality of education that many students experience. Many experience inadequate social and curricular inclusion.

Despite the intense debate regarding inclusive and segregated education, and the fact that most children with vision impairment in developed countries attend regular education; the efficacy of their inclusive education has not been determined. Furthermore, their level of performance relative to peers has not been established. Much of the knowledge gap and the limitations in the childhood vision impairment research can be traced to the methodological issues inherent within the population.

Still, the adequacy of the situation that children with vision impairment are exposed to in regular schools remains unreported. There is concern about the inconsistent level of inclusion they experience, but these are unexplained. While the influence of individual variables has been described among typical populations and other children with disabilities, it is not known what makes the difference between successful and unsuccessful performance among children with vision impairment. The current research aims to address these knowledge gaps and methodological issues.

The research begins with a formative study: Phase 1. Phase 1 informed the main part of the study. Stakeholders generated important factors that they perceived to influence inclusive outcomes for children with vision impairment in Australia. The factors that were generated by stakeholders then went on to form the independent variables for the main part of the study. Phase 1 is presented in the following chapter, chapter 3.

CHAPTER 3

PHASE 1
GENERATION OF STAKEHOLDER IDENTIFIED FACTORS

3.1 INTRODUCTION

The literature review critiqued factors that stakeholders in various temporal and cultural contexts believed to be influential for students with disabilities. The studies related to students of various ages and conditions; some applied to differing international educational systems; and many were conducted before recent Australian legislative and policy changes. The relevance of the findings from these studies to the current Australian context is unknown. As such, it was deemed necessary to select factors that were relevant to this context before proceeding to measure and use these factors as predictors in the main part of the study. In order to select independent variables relevant to children with vision impairment in the contemporary Australian context, the perspective of key stakeholders was sought.

This chapter focuses on the first phase of the current research. The phase was formative and focused on identifying independent variables for testing in the main phase of the study; the research aim and objectives are described below. This chapter describes the method used to generate and select stakeholder factors. The results are presented and major findings discussed.

3.2 AIM

To select factors that stakeholders perceive are most important in influencing the inclusive outcomes of children with vision impairment in regular early education in the current Australian context.

3.3 SPECIFIC OBJECTIVES

The objectives of Phase 1 were:

a) to determine what stakeholders perceive to be the ten most important factors influencing the success of children with vision impairment in early regular education; and

b) to determine what, if any differences exist between the views of different stakeholder groups.

3.4 METHODS

3.4.1 Design

Nominal Group Technique (NGT) was used to elicit stakeholder views about factors that influence the success of children with vision impairment and to generate ranked lists of these factors. NGT involves a group meeting in which a structured format leads to collaborative decision making among individuals (Van de Ven & Delbecq, 1974). It is comprised of five main stages: individual idea generation, round robin sharing of ideas, group discussion, voting and vote tallying (Figure 3.1).

NGT is a particularly effective method for idea generation and developing group consensus when a specific, pre-identified question requires a group's judgements (Sink, 1983). The format allows group members to pool judgements, and limits the stifling of individual creativity that can occur through brainstorming. The structured format ensures that all participants are equally involved in the process (Delbecq, Van de Ven, & Gustafson, 1986; Sample, 1984); increasing unity of output and participant satisfaction (Sink, 1983). NGT has proved more effective than conventional interactive groups in terms of quantity of ideas generated (Van de Ven & Delbecq, 1974). It produces greater participant satisfaction than other group processes, such as the Delphi Technique. The Delphi Technique was considered as a method to involve participants throughout Australia; however NGT was chosen due to its group process advantages, cost and time efficient meetings and format that was hypothesised to capture more participants (Cameron, 1995) (see Section 7.4.11).

3.4.2 Participant Selection

Five groups of participants were recruited for the NGT meetings: (1) allied health professionals; (2) visiting teachers; (3) regular primary teachers and education assistants; (4) students with vision impairment; and (5) parents of children with vision impairment. Meetings involved homogenous rather than mixed stakeholder groups. This served three main purposes. Firstly, it allowed comparison of differences amongst stakeholder groups. Secondly, homogenous groups reduce participant inhibitions and facilitate openness (Delbecq et al., 1986). Finally, the potential power differential between different stakeholders groups (e.g. students and their teachers) could be eliminated.

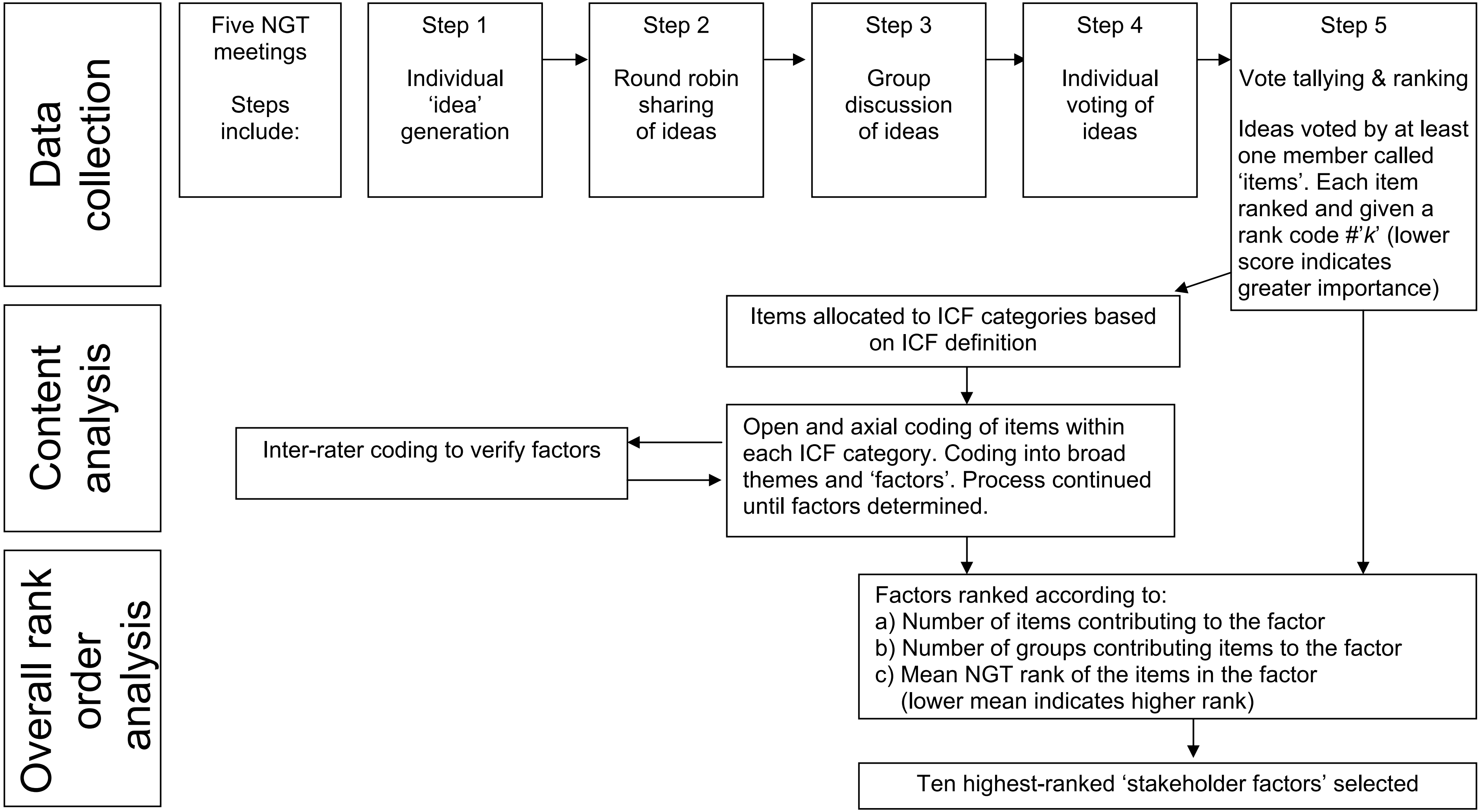


Figure 3.1. Flowchart of Phase 1 data collection procedures and analysis

Between five to seven participants were sought for each meeting, based on NGT recommendations for optimal group size (Delbecq et al., 1986). Individuals currently residing in metropolitan Western Australia (rather than other Australian states, to reduce the time and costs) who belonged to one of the following stakeholder groups were eligible:

1. allied health professionals who had worked with children with vision impairment attending regular education (kindergarten to primary grades) within the last year;
2. visiting teachers who had worked with children with vision impairment attending regular education (kindergarten to primary grades) within the last year;
3. teachers or education assistants who had taught a student with vision impairment in a regular classroom (kindergarten to primary grades) at a regular school within the last year;
4. students or ex-students (aged 13-25 years) with vision impairment and no significant co-existing disabilities who had or were currently attending mainstream education classes. The minimum age of thirteen was chosen to ensure that participants were able to engage in abstract thought, reflect on their experiences and express their views in a group situation (Inhelder & Piaget, 1958; Keating & Clark, 1980; Peterson & Leffert, 1995).
5. parents or caregivers of children with vision impairment whose child attended a regular classroom (kindergarten to primary grades) in a regular school within the last year.

The following people were excluded from participation:

1. allied health professionals, visiting teachers, regular teachers or education assistants who provided services only to students with vision impairment attending special education units, centres or schools; that is, with no mainstream school experience; and
2. parents of, or individuals with vision impairment who were educated only in special education units, centres or schools; that is, with no regular school experience.

Teaching staff were recruited primarily through the Vision Education Service, a specialised division of the Department of Education and Training, Western Australia. Invitations were extended via letter (Appendix A) and a presentation was given to visiting teachers who met the selection criteria. Vision Education Service staff also forwarded these invitation forms to classroom teachers with students with vision impairment. The remaining participants were recruited through the Association for the Blind of Western Australia, a non-government organisation that provides multidisciplinary services to children and adults with vision impairment. The Association for the Blind was provided with the selection criteria, and they forwarded invitations to eligible allied health professionals, parents of children with vision impairment and students with vision impairment. In addition, an advertisement was placed in the Association for the Blind consumer newsletter and an on-line parent support group posted an advertisement and distributed invitations to parents of and individuals with vision impairment (Appendix B). Willing participants contacted the researcher directly.

3.4.3 Ethics

Ethics approval was gained from Curtin University Human Research Ethics Committee (Reference Number HR 169/2004) (Appendix C), the Chief Executive Officer of Association for the Blind and the Acting Manager of Vision Education Service. Participation was informed and voluntary, and participant consent was obtained in written or alternative-to-print format as required (Appendix D). Guardians provided consent for children under the age of 18 years (National Health and Medical Research Council [NHMRC], 2005).

Efforts were made to maintain confidentiality: participant details were not disclosed to recruiting organisations and data were de-identified. In addition, because participants directly interacted with one another during the NGT groups, they were requested to avoid disclosing member information after the group. However, this could not be ensured, thus all participants were informed of this prior to giving consent. Reimbursement was offered for travel costs associated with attendance. Finally, data were stored and secured according to NHMRC requirements (NHMRC, 2005).

3.4.4 Data Collection Procedures

The question posed in the NGT groups was: What are the important factors influencing the participation, engagement, social and academic performance of children with vision impairment in early regular education? (Appendix E).

A standard NGT protocol was used for all group meetings (Appendix F) (Delbecq et al., 1986). Terms central to the research question (vision impairment, early mainstream education, social performance, academic performance, engagement and participation) were defined in the opening script to promote consistency amongst groups. The NGT protocol consisted of (1) silent, independent generation of ‘ideas’ by each group member, (2) round-robin recording of all group member ideas, (3) group discussion of each idea, and (4) voting by each member and (5) vote tallying and ranking by the facilitator (Delbecq et al., 1986). Discussion was an important part of the process. Members defined and argued the relative merits of ideas and expanded or combined the phrasing of ideas to succinctly reflect their perspective.

The voting stage involved individual members systematically voting for up to eight ideas (depending on the total number of ideas generated by the group, see Appendix Table F1) (Delbecq et al., 1986) that they deemed *most important*. Members allocated a score of one to eight to each idea, with higher scores indicating greater importance (Delbecq et al., 1986). Ideas that received one or more participant votes became known as ‘items’. The tallying and ranking process is described in the analysis section. The completion of each NGT group resulted in a separate ranked lists of items. These items consisted of descriptions, phrases and examples in participant-agreed phrasing. ‘Member checking’ was ensured, since the group results were tallied and presented to participants at the completion of each group.

All NGT meetings were facilitated by the researcher and monitored by an independent, trained observer to promote consistency. The observer assessed the facilitators’ adherence to standard procedures through the completion of a 22-item checklist, adapted from previous research (see Appendix G) (Cameron, 1995). In addition, participants each completed a demographic questionnaire, which elicited details regarding age; professional, educational or parenting experience; and vision impairment where relevant (see Appendix H).

3.4.5 Pilot Test

The NGT protocol was pilot tested in one meeting with five health professionals who did not meet the study selection criteria (to preserve the sample). Upon completion, the group gave feedback on the clarity of instructions, ease of understanding and satisfaction with the group process. Minor modifications were made to the facilitator instructions for the voting process as suggested. The format for recording group ideas and votes was also modified to increase clarity of displayed results. Finally, due to the strong emphasis on writing and printed media in the NGT process (to record individual ideas and group input), modifications were devised to facilitate the involvement of participants with vision impairment. This included the use of optical and non-optical devices and sighted assistants. The appropriateness of these modifications was confirmed through consultation with two professionals in the field of vision impairment.

3.4.6 Analysis

Analysis sought to identify the top ten stakeholder factors and to compare factors among stakeholder groups. The systematic process used to identify the top ten stakeholder factors is described below.

Vote tallying and ranking: Participant votes were tallied by the facilitator at the completion of each meeting (step 5, Figure 3.1). Vote scores were summed for each item. Items with a higher summed score were deemed more important. Ties were resolved by deeming items that received votes from a greater number of participants as more important (Delbecq et al., 1986). For example, if two items attained a summed score of 13, the item chosen by three participants was ranked higher than the item voted upon by two participants. If a tie still existed, items received the same ranking. A 'rank code' was assigned to each item (#*k*), with a rank code of '#1' indicating the most important item. A ranked list was obtained for each of the groups.

The data from the five groups were synthesised into one list using a combination of qualitative and quantitative techniques. Content analysis was used to combine the separate lists into one comprehensive list of factors, then these were ranked to determine the top ten stakeholder factors.

Content analysis: Content analysis involves thematic analysis, reducing the data into themes and examining emerging trends (Portney & Watkins, 2000; Stemler, 2001). This systematic approach is useful because it promotes transparency and replicability of qualitative analysis (Berg, 2004; Bryman, 2004; Portney & Watkins, 2000; Stemler, 2001). Both inductive and deductive techniques were incorporated into the content analysis to ground it in both data and theory (Berg, 2004).

A deductive approach was initially used to sort items into overarching ICF categories (WHO, 2001). The ICF provided a strong theoretical framework for the analysis, since it reflects contemporary international attitudes towards disability, participation and the impact of contextual and personal factors (WHO, 2001). Phrases in the items were allocated into Activity Performance, Body Structure, Body Function, Personal, Environmental or Participation factors according to ICF definitions. A second researcher, proficient in the use of the ICF confirmed the allocation of items to the ICF categories. The use of a second independent researcher enhanced validity of the process (Duncan, 1989; Portney & Watkins, 2000).

Next, open and axial coding was used to inductively identify themes, then specific 'factors' as they emerged within each ICF category (Berg, 2004). The second researcher was involved in reviewing these emerging trends. The identification of emerging factors continued until the data became saturated with repetitions of codes. Each item underwent coding by the researcher. Three additional independent researchers coded one third of the data (Duncan, 1989; Portney & Watkins, 2000; Stemler, 2001). A level of 80% agreement with the researcher coding was used to determine acceptable consistency (Portney & Watkins, 2000; Stemler, 2001).

Overall rank order analysis: The qualitative analysis produced a list of factors that were common among stakeholders. Quantitative analysis was then undertaken to rank the factors. Factors were ranked according to the number of items that they contained. Some factors contained the same number of items, so additional criteria were used for ranking:

1. the number of stakeholder groups who contributed items to the factor. The greater the number of groups, the more important. If ties still existed they were ranked by the second caveat;
2. the mean NGT rank of the items (as determined by each NGT group) in the factor. A lower mean score indicated greater importance.

For example, two factors, parent involvement and teacher training and experience, each contained six items generated by five groups. However, parental involvement had a lower mean item rank (3.7 vs. 5.5) and thus was deemed more important than teacher training and experience.

Only factors that contained at least three items generated by at least two stakeholder groups were considered to be valid and reflect a trend rather than mere chance (Berg, 2004). Based on these criteria, a ranked list of factors was established and the top ten factors were selected as ‘stakeholder factors’.

In order to determine what, if any difference existed between stakeholder groups, descriptive comparisons were made. The percentage of Activity Performance, Body Function, Personal, Environmental and Participation factors that each group contributed to (among the overall factors and top ten factors) were compared. Similarities and differences between groups were documented.

3.5 RESULTS

3.5.1 NGT Groups and Participants

Five NGT meetings were held in metropolitan Western Australia during November 2004, with each meeting lasting two hours (Delbecq et al., 1986). Twenty five participants replied to the invitations and were involved in the meetings (n = 7 allied health professionals, n = 5 visiting teachers, n = 3 regular teaching staff, n = 7 parents and n = 4 students). Allied health professionals (78%) and visiting teacher (50%) response rates were acceptable. The parent (6.4%), student (16%) and teaching staff (rate undetermined due to recruitment process) rates were low, despite several recruitment drives and attempts to encourage participation (convenient times and locations; child-minding services).

The three professional stakeholder groups were all comprised of females who had experience working with children with vision impairment during the last year (Table 3.1). Allied health professionals and visiting teachers had each worked with more than 15 clients with vision impairment, most for over six years. The regular teaching staff had taught up to two children with vision impairment.

The student stakeholder group included one male and three females with vision impairment aged between 17 and 20 years. Three participants had low vision and one was blind. Vision conditions included: Peter's Anomaly (n = 1); accommodation, convergence weakness and field restrictions (n = 1); Stargardt's (n = 1); and Leber's Optic Neuropathy (n = 1). None had co-existing disabilities. Whilst the onset age and severity of their vision impairment varied, all students experienced vision impairment during primary school. Participants had completed their entire primary and secondary education in mainstream schools during the years of 1988 to 2004.

The parent group consisted of six mothers and one grandmother. Their seven children were enrolled in grades 3 - 6, and had attended regular schools during 1998 to 2004. All children had low vision; with vision conditions including: albinism (n = 1), bilateral cataracts (n = 1), Stargardt's (n = 2), nystagmus (n = 1), septo-optic dysplasia (n = 1) and corneal opacity (n = 1). One child was diagnosed with mild intellectual disability and the remaining children had no co-morbid disabilities.

Table 3.1. Participant demographic characteristics by stakeholder group

Group	Age in years	Years of professional experience	Professional experience with VI		
			Years	Client age in years	
				Youngest	Eldest
	M(SD)				
Allied health [a]	36.0(13.9)	13.6 (10.3)	6.7 (6.9)	0.0 (0.0)	18.0 (4.9)
Visiting teachers [b]	47.6(10.3)	10.8 (5.5)	6.2 (5.7)	3.0 (2.1)	13.0 (5.1)
Teachers [c]	-	13.3 (15.0)	2.5 (1.2)	4.3 (0.6)	6.0 (1.7)
		Age in years that VI was noticed *M(SD)*		Best corrected visual acuity *n*	
		Onset	Diagnosis	6/18 -3/60	< 3/60
Students [d]	18.8 (1.5)	6.5 (6.6)	12.0 (8.0)	3	1
Parents [e]	42.8(11.5)				
Their children [f]	10.4 (1.6)	2.1 (3.7)	2.7 (4.6)	7	

Note. VI = Vision impairment.

[a] *n* = 7. [b] *n* = 5. [c] *n* = 3. [d] *n* = 4. [e] *n* = 7. [f] *n* = 7.

3.5.2 NGT Results

The stakeholder groups generated between 17 (regular teaching staff) to 42 (visiting teachers) ideas in their NGT meetings (Table 3.2). This resulted in generation of between 10 to 22 items per group, where an item was defined an idea that received one or more participant votes (Appendix I details individual stakeholder group items). As such, a total of 77 stakeholder-ranked items underwent content and rank order analysis.

Content analysis resulted in the extraction of 87 phrases that were coded into 23 factors. The researcher attained 83.3% agreement with the three independent raters on coding of the data into factors. This met the acceptable margin for validity of the qualitative analysis (Duncan, 1989; Portney & Watkins, 2000; Stemler, 2001).

Table 3.2. Number of stakeholder ideas, items and overall factors

Stakeholder group	No. ideas suggested in NGT meeting	No. items receiving votes in NGT meeting	No. overall factors
Allied health	34	16	23
Visiting teachers	45	22	
Teachers	20	10	
Parents	17	12	
Students	22	17	

Note. NGT = Nominal group technique.

The results of the overall rank order analysis are presented in Table 3.3. An example of the overall rank order process of inclusive attitudes is provided to explain the table. Inclusive attitudes emerged as a factor within the ICF category Environment. During content analysis, phrases from ten stakeholder items were coded into the inclusive attitude theme – the 5th ranked allied health professional item; the 7th and 11th highest ranked visiting teacher item; the 1st and 3rd ranked regular teacher items; 2nd, 4th, 9th and 15th ranked student item; and the top ranked parent item. Thus the overall ranking criterion was six items and five groups. This was ranked higher than the following factor, individualisation, which had ten items from only four groups. The mean rank of the items contributing to inclusive attitudes was 5.8.

Table 3.3. Factors (from most to least importance) by ICF category, identified through analysis of stakeholder group items

Factor	ICF category	Rank code of items contributing to the factor [a]					Ranking criteria		
		Allied health professionals	Visiting teachers	Regular teachers	Students	Parents	No. items	No. groups	Mean item rank
1. Inclusive attitude	Environment	#5	#7 #11b	#1 #3a	#2a #4 #9 #15b	#1	10	5	5.8
2. Individualisation	Environment	#10c #12b	#12a	#5 #6	#3 #4 #5 #11 #14		10	4	8.1
3. Staff support	Environment	#5 #11	#13 #14b #15b		#7	#2	7	4	9.6
4. Parent involvement	Environment	#1	#4 #10	#2a	#1	#4	6	5	3.7
5. Teacher training and experience	Environment	#7	#3b #6	#3a	#7	#7b	6	5	5.5

(table continues)

Table 3.3. ***(continued)***

Factor	ICF category	Rank code of items contributing to the factor [a]					Ranking criteria		
		Allied health professionals	Visiting teachers	Regular teachers	Students	Parents	No. items	No. groups	Mean item rank
6. Early intervention	Personal	#3	#1 #12b	#2a		#6	5	4	4.8
7. Physical environment	Environment	#8 #13		#4a	#13	#8b	5	4	9.2
8. Social skills	Activity	#4	#11a #15c			#3 #8a	5	3	8.2
9. Adult involvement	Environment			#2b #3b	#2b #10 #15a		5	2	6.2
10. Vision aides and equipment	Environment		#2	#3c	#2b	#5	4	4	3
11. Prior preparation of class activities	Environment		#12a	#4b	#6		3	3	7.3
12. Vision impairment severity	Body function	#2 #10a	#8				3	2	6.7

(table continues)

Table 3.3. ***(continued)***

Factor	ICF category	Rank code of items contributing to the factor [a]					Ranking criteria		
		Allied health professionals	Visiting teachers	Regular teachers	Students	Parents	No. items	No. groups	Mean item rank
14. Personality	Body function	#4	#5				2	2	3.5
15. SES status	Personal	#1	#14a				2	2	7.5
16. Peer attitude	Environment		#10		#12		2	2	10.5
17. Orientation and mobility skills	Activity		#14c		#8		2	2	11
18. Developmental level	Activity	#9	#11a				2	2	11.3
19. Co-existing disability status	Body function	#6					1	1	6
20.Professional tutoring	Environment					#7a	1	1	7
21. Extra-curricular activity involvement	Participation					#8c	1	1	8
22. Nutrition	Personal					#9	1	1	9
23. Independence skills	Activity		#14c				1	1	14

Note. *#k* = ranking of item in each stakeholder group. Lower scores indicate greater importance; Activity = Activity Performance.
[a] Details of the individual items respective to each rank code are provided in Appendix I.

3.5.3 Top Ten Factors

The ten highest ranked stakeholder factors were (in order of importance): (1) inclusive attitude, (2) individualisation, (3) staff support, (4) parent involvement, (5) teacher training and experience, (6) early intervention, (7) physical environment, (8) social skills, (9) adult involvement, and (10) vision aides and equipment. Each of the ten highest ranked factors included at least four items that were nominated by at least two stakeholder groups, thereby meeting the criteria for consideration as a pattern of important themes rather than a coincidence. The top ten factors included contributions from all stakeholder groups: nine parent generated items, 11 each from allied health professionals and regular teaching staff, 15 from visiting teachers and 17 student generated items. Each of the stakeholder groups contributed to eight of the top ten factors. The top ten factors are described are detail in Table 3.4.

The majority of stakeholder factors generated overall and in the top ten were Environmental factors (Table 3.5). Environmental factors in the top ten included: inclusive attitude, individualisation, staff support, parent involvement, teacher training and experience, physical environment, adult involvement and vision aides and resources. Only two of these factors: physical environment and vision aides and resources related to physical environmental features. The remaining factors related to attitudinal or personal support within the environment (e.g. inclusive attitude, parent involvement, teacher training and experience). The top ten stakeholder factors included only one activity performance and one activity factor, and no body function or structure factors.

Table 3.4. Description of top ten stakeholder factors and examples of contributing items

Factor	Description	Example of items (*stakeholder group* and item rank code)
Inclusive attitude	Whole school and teacher attitudes about inclusion	Inclusive education practices in the school (*S*#15)
Individualisation	Appropriateness of curriculum programming and delivery, for the individual child with vision impairment	Appropriate assessment and learning modes (*A*#10)
Staff support	Amount of support available for classroom teachers including time, personnel and specialists.	Support for teachers in mainstream schools and presence of an education assistant (*P*#2)
Parental involvement	Level of parental input and support provided for the child with vision impairment both at home and at school.	Parental involvement and support at home: being involved in school, knowing what is happening (*S*#1)
Teacher training and experience	Classroom teacher's initial and ongoing training and experience	Training for teachers regarding specific knowledge about vision impairment and inclusive strategies…(*P*#7)
Early intervention	Amount of early intervention	Early intervention (educational or therapy as appropriate) as early as possible up to three years of age (*V*#1)
Physical environment	Accessibility of the classroom and school environment for children with vision impairment	Physical school environment: accessibility, lighting, safety.. (*A*#13)
Social skills	Pro-social behaviours and interpersonal skills to interact in individual and group class situations	…ability to make friends, confidence, coping strategies (*A*#4) …being able to speak up to ask for what they need (*P*#3)
Adult involvement	The appropriateness of staff assistance provided to children	Level of staff assistance. Avoid over-protecting the child with vision impairment or doing too much for them…(*T*#3)
Vision aides and equipment	Adequacy, availability and timeliness of vision specific resources and equipment in the classroom.	Provision of appropriate aids (including vision aids and others), training the student availability…acceptance….(*V*#2)

Note. Stakeholder groups are denoted by abbreviations: S = Students; A = Allied health professionals; P = Parents; V = Visiting Teachers; T = Teaching staff;
#*k* = ranking of item in each stakeholder group. Lower scores indicate greater importance.

Table 3.5. Number (%) of overall and top ten factors, by ICF category and stakeholder group

Stakeholder group	No. of factors (%) by ICF category					
	Environ.	Personal	Activity	Body Function	Particip.	Total
	Overall factors					
All groups	12 (52.2)	3 (13.0)	4 (17.4)	3 (13.0)	1 (4.3)	23
Allied health	7 (50.0)	2 (14.3)	2 (14.3)	3 (21.4)		14
Visiting teachers	9 (52.9)	2 (11.8)	4 (23.5)	2 (11.8)		17
Regular teachers	8 (88.9)	1 (11.1)				9
Students	10 (90.9)		1 (9.1)			11
Parents	7 (63.6)	2 (18.2)	1 (9.1)		1 (9.1)	11
	Top ten stakeholder factors					
All groups	8 (80.0)	1 (10.0)	1 (10.0)	0 (0.0)	0 (0.0)	10

Note. ICF = WHO International Classification of Functioning, Disability and Health; Environ = Environment; Activity = Activity Performance; Particip = Participation.

3.5.4 Stakeholder Groups by ICF Category

All of the five stakeholder groups contributed more to environmental factors than the other ICF categories. The majority of stakeholder factors generated overall and in the top ten were Environmental factors. Environmental factors in the top ten included inclusive attitude, individualisation, staff support, parent involvement, teacher training and experience, physical environment, adult involvement and vision aides and resources. Only two of these factors; physical environment and vision aides and resources related to physical Environmental factors. The remaining factors related to attitudinal or personal support available within the environment (e.g. inclusive attitude, parent involvement). The *top ten* factors only included one Activity Performance factor and no Body Function or Structure factors.

Almost all of the *overall* factors that the student and regular teaching staff groups contributed to were environmental. Allied health professionals and visiting teachers identified the least amount of Environmental factors. These two groups did, however, contribute more than other stakeholder groups to the Activity Performance factors. Regular teaching staff did not contribute to Activity Performance factors at all. Activity Performance factors included: developmental level, orientation and mobility skills and social skills. Furthermore, allied health professionals and visiting teachers were the only groups to generate Body Function factors. These included: severity of vision impairment, personality and co-existing disabilities (allied health professionals only).

All stakeholder groups except students contributed to Personal factors. These included the level of early intervention a child had received, socio-demographic status and nutrition. Parents were the only group to identify a Participation factor – involvement in extra-curricular activities as influential for success of children with vision impairment in education. Furthermore, no items relating to Body Structure were suggested by any group.

3.6 DISCUSSION

This section discusses the main findings of Phase 1. It demonstrates that the top ten factors were supported by stakeholder groups and by previous literature, and thus are relevant factors to measure in the main part of the study. Following this, the ICF classification of the stakeholder factors is discussed, with relevance to models of disability. The factors that were included in the top ten and those that were unexpectedly absent from the top ten factors are reviewed, and stakeholder group differences are justified.

3.6.1 Top Ten Factors

The top ten factors reflect a high degree of agreement among stakeholders. Seventy percent of factors in the top ten were generated by at least four of the five stakeholder groups. All five groups agreed on three factors: inclusive attitude, parental involvement, and teacher training and knowledge. In addition, five factors were generated by four of the stakeholder groups: individualisation, staff support, early intervention, physical environment and vision aides and equipment. In particular, the two highest ranked factors, Inclusive Attitude and Individualisation, were strongly supported as the most important factors influencing the success of children with vision impairment. Each was comprised of ten items (the next most important factor, staff support contained seven items), and was voted upon by at least four groups. Inclusive Attitude was clearly the most important factor. It was nominated by all five stakeholder groups and included the highest ranked items from both the regular teacher and student groups, and the second highest ranked item from the parent group.

Most of the top ten factors that were generated by stakeholders in this study are consistent with stakeholder perspectives reported in previous studies. Six of the top ten factors (attitude, training and knowledge, staff support, physical environment, vision aides and equipment, and parent involvement) were common factors identified earlier in the literature review of nineteen stakeholder studies (Kilgallon & Maloney, 2003; OECD, 2005; Wolery et al., 1995). The stakeholder factor, staff support, comprised of five of the factors identified by previous stakeholders in the literature: classroom and school personnel; specialists; emotional and administrative support from the principal; and funding. However, unlike other studies, in which stakeholders only focused on personnel or the presence of an education assistant (Forlin, 1995; Werts et al., 1996), stakeholders in this study extended the definition to include other forms of support. In addition, the stakeholder factor, individualisation, encompassed aspects identified in the literature such as curriculum and instruction (Ingram, 2004; Leiberman et al., 2006; Simeonsson et al., 2001).

The environmental factors generated by stakeholders in this study are also supported by Bishop (1986). The studies share three of the same top ten stakeholder ranked 'school'/environmental factors necessary for the success of students with vision impairment in 'integrated' educational settings: (1) inclusive attitude (accepting/flexible regular classroom teacher was also the highest ranked 'school factor' in Bishop's study); (2) staff support (available support personnel was the second ranked school factor); (3) vision aides and equipment (adequate special supplies/equipment was the fourth-highest ranked school factor in Bishop's study). Though this study was conducted 20 years ago, aspects are still relevant in today's context. However, whilst the environmental factors were similar, the top ten factors in the current study did not include any of the 'student', 'family' or 'community' factors reported by Bishop. Four of these were, however identified as items by individual stakeholder groups (emotional stability, independence, realistic expectations, and opportunity to participate in local activities).

Three of the top ten stakeholder factors have not been previously generated by *stakeholders* in stakeholder research: early intervention, social skills and adult involvement. However, the wider literature and outcome studies support the relevance of these factors for the education of children with vision impairment. While early intervention (Brambring, 1996; Erwin, 1994; Sonksen et al., 1991) has a potentially positive effect on development, social skills (Erwin, 1993; Kekelis, 1992b) and adult involvement (Erwin et al., 1999; Kekelis & Sacks, 1988; D. Lewis & Allman, 1999) have been reported to facilitate social performance and classroom participation for children with vision impairment.

3.6.2 ICF Classification

Resoundingly, most of the stakeholder generated factors focused on the Environment. Over half the overall factors and eight of the top ten factors were classified in the ICF Environment category. Stakeholders placed much less emphasis on the body function, personal or disability characteristics of the children and their families. This indicates that stakeholders perceive that physical, attitudinal and support structures within the child's educational and home environment can promote the learning, interaction and involvement of children with vision impairment in early education. The literature supports this strong focus on environmental features. Of the fourteen stakeholder studies reviewed that investigated a range of factors (not just critical supports), *all* nominated environmental factors as important, barriers or major concerns for the inclusion of students with vision impairment or other disabilities. Only four of these studies emphasised any body function, activity performance or personal factors.

Findings from Bishop (1986) however indicate a different trend. When stakeholders were asked "what is success [for children with vision impairment] or what is it about the student, school, home environment or community that determines it?", a high proportion of the 34 overall stakeholder generated factors (55.9%) and of the top ten ranked variables (50%) were related to activity performance, whilst fewer (41.2% and 50% respectively) could be categorised as environmental factors. However, since a 'double barrelled' question was posed to participants, the higher proportion of activity performance variables may have been due to stakeholders generating factors that *define* success (such as academic performance) as well as contributing to it.

The stakeholder results support the international recognition that student's progress cannot be viewed only as being caused by their disability or diagnosis. Rather, performance is viewed, in large part, as due to the school's ability to adequately cater for them (OECD, 2005). This is in line with the very definition of inclusion: that the class and school are adapted in such a way to meet the spectrum of needs and abilities of students, rather than the student adapting to the regular classroom (Elkins, 2002; D. Power & Hyde, 2002). Furthermore, contemporary disability theory emphasises the importance of enabling and disabling features of the environment. For example, the social model views disability as a social construct that is imposed *on top of* impairments (Shakespeare, 2006). This model suggests that the experience of people with disabilities is dependent on the social context, which varies in different cultures (structures, norms) and at different times (Shakespeare, 2006). The importance of the environment is also emphasised in disability theories such as the Person-Environment-Occupation models (Bass-Haugen & Mathiowetz, 1995; Christiansen, Baum, & Bass-Haugen, 2005; Kielhofner, 2002; Law et al., 1996), the ICF (WHO, 2001) and research (Wallenius, 1999). In applying these models, disability can be reduced, or possibly even eliminated by modifying the context. Research has found that even the perception that an environment is supportive can influence one's well-being (WHO, 2001). Thus, Environmental factors may potentially act either as facilitators or barriers for a student with vision impairment, enhancing or hindering their performance in the regular classroom.

Furthermore, the ICF defines Environment as consisting of five elements – products and technology; natural environment and human made changes to the environment; supports and relationships; attitudes; and services, systems and policies (Arter et al., 1999; Best, 1992; Mayfield et al., 1996). Most of the Environmental factors generated in this study were associated with the supports and relationships (individualisation, staff support, parent involvement, adult involvement) with few focused on the physical environment or products. Stakeholders perceived that the input of those around the child with vision impairment has a substantial impact on their educational performance. In clinical guidelines, there is a strong focus on the physical modifications and instruction methods for children with vision impairment (Carta et al., 1990; Ferguson et al., 2001). Whilst these may be clinically relevant, there may also be a need for increased focus on other support and attitudinal features.

Stakeholders placed relatively low importance on Activity Performance, Body Function or Personal factors in this study. Few of the child's skills, impairment or socio-demographic factors were deemed critical in influencing performance. Whilst stakeholders in this study and previous research did not emphasise these factors, consistent findings of large, longitudinal, quantitative studies provide contrary evidence; highlighting the strong impact of readiness skills (Meisels & Liaw, 1993; Ryan & Adams, 1998), socio-demographic factors (Powers, 2003; Simeonsson et al., 2001) and disability severity (Gale & Cronin, 1998; Hatlen, 1996; Wolffe et al.,

2002) on school achievement. The stakeholder results reflect a contemporary trend to focus less on school readiness skills or impairment and more on enabling factors, but it remains uncertain whether these may actually have a significant impact.

Interestingly there was little emphasis on the Expanded Core Curriculum (neither the teaching of the curriculum nor the actual skills) (see section 2.7.3.1). Social skills was the only Expanded skill to be selected in the top ten factors. Stakeholders focused somewhat on the technology and vision aides (training and availability of the resources, but not student proficiency), and one and two stakeholders voted for independence and orientation and mobility skills respectively. However, the stakeholders did not mention compensatory academic skills (such as Braille, listening skills, spatial understanding or tactile skills), functional use of low vision, or recreation and leisure skills.

The lack of focus on the Expanded Core Curriculum is in contrast to much of the childhood vision impairment literature. Expanded skills are promoted in the literature as critical factors for children with vision impairment to succeed academically and socially at school, and they are described, perhaps rightly so, as the building blocks for further learning. There are several explanations for this lack of emphasis. Stakeholders may have omitted the skills or curriculum based on pedagogy. It is reasonable to assume that different aspects of the Expanded Core Curriculum are *more* or *less* critical at times throughout the development span. However, it would be hypothesised that, particularly compensatory academic skills and stimulation of the functional use of low vision would be applicable skills required to successfully begin formal learning. Stakeholders may have assumed that these foundation skills are commonly addressed in early intervention (rated the sixth most important factor).

On the other hand, stakeholders may perceive that environmental factors are foremost to the Expanded Curriculum or skills. It is feasible that, given an appropriate physical, cultural and supportive environment, children have a greater ability to learn skills required. However, when this environment is inadequate, efforts to compensate for the child's skills may be in vain.

3.6.3 Comparison of Stakeholder Groups

The 23 overall factors reflect a moderate degree of agreement amongst stakeholder groups. The majority of the overall factors (18, 78.2%) were generated by at least two groups. However, some factors received fairly low agreement amongst the stakeholder groups. As would be expected, each of the groups emphasised items that were relevant to their experiences, training and perspective of vision impairment.

Allied health professionals and visiting teacher stakeholder groups tended to more clinically based activity performance and body function factors, such as vision level, developmental level, personality, socio-demographic status, co-existing disabilities (allied health professionals only) and well as support for the family. Parents tended to vote for personal factors and those that were beyond the realm of the school domain; such as professional tutoring, involvement in extra-curricular activities and nutrition, reflecting their home experiences with their child with vision impairment.

Students and regular teaching staff focused primarily on environmental factors and were the only groups to perceive adult involvement as influential to children’s success. This is sensible, given that students and classroom staff deal with the day-to-day practical issues to make inclusion work for the individual students (Rief & Heimburge, 2006). There were no explicit trends evident between stakeholder group results in this study and in the 19 studies reviewed. This may be due to the fact that mixed stakeholder groups were included in previous research.

3.7 CONCLUSION

This phase has determined the perception of Western Australian stakeholders regarding the factors that influence the success of children with vision impairment in early education. The top ten ranked items were (1) inclusive attitude, (2) individualisation, (3) staff support, (4) parent involvement, (5) teacher training and experience, (6) early intervention, (7) physical environment, (8) social skills, (9) adult involvement, and (10) vision aides and equipment.

The majority of these factors are supported by earlier stakeholder research. Stakeholders in this study generated mostly Environmental factors, which reflects current disability theory and inclusive perspectives. There were some differences between stakeholder groups, primarily based on the roles and experiences that each stakeholder has with the child with vision impairment.

While stakeholders perceive that the factors that they identified have an effect on student outcomes, the research has not as yet determined whether this is true. In addition, the adequacy of these factors (i.e. the situation) that children are exposed to in early education is as yet unknown. The next phase addresses these questions.

The top ten stakeholder factors form the independent variables for the second phase of the study. In Phase 2, the stakeholder factors and student outcomes are described and compared over time. Then, a longitudinal design tests whether the stakeholder factors are able to predict success outcomes of children with and without vision impairment in regular early education.

Phase 2 is presented in chapters 4 to 6. Chapter 4 describes the methods used in Phase 2. Following this, the Phase 2 results are reported in chapter 5 and discussed in chapter 6.

PHASE 2

FACTORS PREDICTING INCLUSIVE OUTCOMES OF CHILDREN WITH VISION IMPAIRMENT

CHAPTER 4

METHODS

4.1 INTRODUCTION

Although many of the ten stakeholder factors that were generated in Phase 1 (chapter 3) are commonly reported in the vision impairment or inclusive education literature, their impact on the student outcomes has not yet been determined. Methodological issues inherent in childhood vision impairment have impacted on the ability to measure these factors through quantitative or experimental research.

In order to enhance the experience of children with vision impairment in regular education, it is first necessary to determine (a) the current situation that children are exposed to (to know whether improvements can be made in this situation), (b) the outcomes achieved by children with vision impairment (to know whether they are indeed experiencing problems with inclusion), and (c) to determine which factors influence these outcomes (to know which areas to target for intervention). This provides evidence on which to base interventions and recommendations. This second phase of the study aimed to address some common methodological issues and to provide meaningful and useful evidence about the inclusion of children with vision impairment in early education.

This chapter describes the Phase 2 methods. The Phase 2 research aims and specific objectives are described in detail. The design, participants, recruitment and ethics procedures are then outlined. Finally, information about the measurement tools, data collection and analysis are provided.

4.2 RESEARCH AIMS AND OBJECTIVES

The aims and specific objectives of Phase 2 were:

Aim 1: To describe the current situation (i.e. the factors that were identified by stakeholders in Phase 1) that children with vision impairment are exposed to in regular early education.

Specific objectives

To describe the adequacy of the situation experienced by children with and without vision impairment during two years of early education.

1. To determine if there are differences in the situation that children with and without vision impairment are exposed to during two years of early education.
2. To determine if the situation changes during the school year for children with and without vision impairment.
3. To determine if the situation changes for children with vision impairment one year later in a different class.

Aim 2: To determine the inclusive outcomes (participation, engagement, child interaction, academic, and overall) of children with vision impairment in regular early education compared to children without vision impairment.

Specific objectives

To determine whether there is a difference in the inclusive outcomes of children with and without vision impairment during two years of early education.

1. To determine whether inclusive outcomes of children with and without vision impairment change during a school year.
2. To determine whether inclusive outcomes of children with and without vision impairment change one year later in a different class.

Aim 3: To determine the influence of stakeholder identified factors on the inclusive outcomes of children with vision impairment in regular early education.

Specific objectives

1. To determine whether individual factors at the commencement of school influence the inclusive outcomes of children with vision impairment during two years of early education
2. To determine how many collective factors at the commencement of school are required to predict the inclusive outcomes of children with and without vision impairment during two years of early education.

4.3 DESIGN

A prospective, cohort design with two groups (children with and without vision impairment) was employed. The research was longitudinal, spanning the period of two school years. It was comprised of a pilot testing period and three data collection points during the two years:

- Pilot testing occurred three weeks prior to *Time 1;*
- *Time 1* occurred at the beginning of the first school year: Semester 1. It began eight weeks after the commencement of the Queensland school year (the earliest commencing state). This ensured that teachers were sufficiently acquainted with students, and parents had at least some experience of their child attending early education to accurately answer the required questions;
- *Time 2* was at the end of the same school year: Term 4; and
- *Time 3* followed one year later: Term 4.

To increase the sample size, two participant samples were involved in the study. The first sample began at Time 1 in 2005 and the second sample began in 2006; the same relative timeframes were observed for both samples.

4.4 PARTICIPANTS

Children with vision impairment attending regular early education classes in Australia were the focus of the study. Typically performing classmates formed the comparison group. One each of the children's parents, principal and teacher were also recruited. Given the low incidence of childhood vision impairment, children were recruited throughout Australia to attain a sample large enough to ensure statistical power (see below). Victoria, Queensland, New South Wales and Western Australia (the research base) were chosen since they had the largest state populations in 2005 (ABS, 2005).

Children between kindergarten to grade 1 were included in the study. Older children were not included, since they were more likely to have encountered more varied confounding personal factors (such as academic or social success or failure) that would have impacted on educational outcomes (DeRosier et al., 1994; Ferguson et al., 2001). In addition, inclusion of more grade levels would have increased the developmental variance among participants (Ferrell et al., 1998; Hatton et al., 1997). These confounding factors would mean that success could not be accurately attributed to stakeholder factors. Thus, the cut-off level of grade 1 was selected.

The following inclusion criteria were used to select children with vision impairment:

a. diagnosis of vision impairment as their primary disability;
b. attendance at a regular class in a mainstream school or program in Western Australia, Victoria, Queensland or New South Wales;
c. enrolment in a kindergarten, pre-primary or grade 1 program at Time 1; and
d. correct age for grade as defined by the relevant state education department.

The following inclusion criteria were applied to classmates:

a. no diagnosis of vision impairment,
b. attendance at a regular class with a participating child with vision impairment,
c. the same gender as the child with vision impairment,
d. within six months of age of the child with vision impairment,
e. unrelated to the child with vision impairment in the study, and
f. identified by their teacher as a 'typically' performing child.

While teacher nomination of typically performing children results in a comparison group of children with average levels of performance and difficulties, nomination of successful peers may lead to a positively biased comparison group (Wolery et al., 2000). As such, teacher nomination of typical performance was used in this study.

Given the high prevalence of co-existing disabilities amongst children with vision impairment, children with disabilities secondary to vision impairment were included in the sample in order to reflect the actual population. Furthermore, in situations where limited classmates were available or willing to participate, classmates who were identified by teachers as typically performing, but who had mild disabilities were included. However, children with vision impairment and classmates were excluded if they:

a. attended a specialised centre, unit or school for children with disabilities;
b. had been previously retained in a school grade; or
c. were enrolled in an education level beyond grade 1.

A power calculation was conducted to determine the required sample size. Following a literature review, it was hypothesised that social skills may be one of the most influential factors effecting inclusive outcomes, hence a power calculation was based on this hypothesis. Since previous research has used only correlational design, a correlation analysis (of social skills and academic performance) was used to determine the sample size required to provide an adequate statistically power.

The average Pearson Product-Moment correlation between Social Skills Rating System (SSRS) social skills domains at kindergarten and SSRS academic performance of children with disabilities in Australia has been reported at 0.8 (Hood, 2005). The anticipated sample size was based on this reported correlation and the low population of children with vision impairment in Australia. Using a sample size of 20 children with vision impairment, the study would have a 99% power at 5% Alpha level of detecting a significant variance from zero correlation when the correlation between SSRS social skills and academic performance of children with vision impairment is 0.8 over one year (NCSS, 1996).

For typically developing children, the average Pearson Product-Moment correlation between Social Skills Rating System (SSRS) social skills domains at kindergarten and academic performance a year later has been reported as lower, ranging from .15 - .30 (Agostin & Bain, 1997; Risi, Gerhardstein, & Kistner, 2003). Using a potential sample size of 90 children without vision impairment, the study would have 80% power at 5% Alpha level of detecting a significant variance from zero correlation when the correlation between SSRS social skills and academic performance of children with vision impairment is .29 over one year (NCSS, 1996). Using a sample size of 90 children with sight and 20 children with vision impairment, this study would have 85.5% power at 5% Alpha level of detecting a significant difference when the correlation between SSRS social skills and academic performance of children with vision impairment for one year is .8 versus .29 (NCSS, 1996). Thus, four to five classmates were required per child with vision impairment.

4.5 RECRUITMENT

Each group of participants were systematically recruited. Children with vision impairment were recruited first. The researcher provided vision agencies in Western Australia, Victoria and New South Wales with selection criteria and recruitment instructions. The agencies mailed recruitment packs to the parents or guardians of clients with vision impairment meeting the selection criteria (Appendix J). Recruitment in Queensland varied. At the time of recruitment, the state vision agency did not have the details of young clients. Instead, the agency distributed the letters to Queensland Visiting Teachers, who forwarded the invitations to parents. In addition, advertisements were distributed to Queensland ophthalmologists for display in clinics. In all cases, interested parents contacted the researcher directly. Following parent consent, consent was obtained from school principals, then classroom teachers (Appendixes K - L). Teachers were provided with the selection criteria and asked to forward recruitment packs to parents of all eligible classmates (Appendixes M - N).

At Time 3, updated school enrolment details were obtained from the parents of eligible children (those enrolled in grade 2 were ineligible). If the child's principal or teacher had changed from the previous year (i.e. the child changed school or staffing changed) these new staff members were recruited.

4.6 ETHICS

Ethics approval was obtained via Curtin University of Technology Human Research Ethics Committee (Reference number HR 177/2004) (Appendix O). Additional ethics approval was gained from relevant education boards. These included: the Department of Education and Training Victoria (Reference number SOS002803); New South Wales Department of Education and Training (Reference number 04.207); Queensland Department of Education and Arts (Reference number 05/20016); Catholic Education Commission of Victoria (Reference number GE05/0009); Diocese of Toowoomba Catholic Education Office (Reference number 095 JAB/ao'r); Catholic Education Diocese of Rockhampton (no reference number provided); and the Catholic Education Archdiocese of Brisbane (Reference number A11.071.L.E.) (Appendix P).

Formal ethics approval was not required by the following boards at the time of data collection: the Department of Education and Training Western Australia (DET WA, 2004); Catholic Education Office of Western Australia (T. Jackson, personal communication October 30, 2004) nor the Association of Independent Schools (AIS) in Queensland (C. Williamson, personal communication November 18, 2004), New South Wales (M. Hunt, personal communication November 19, 2004), Victoria (A. Smith, personal communication November 23, 2004) or Western Australia (A. Wilkins, personal communication October 20, 2004). Rather, individual schools determined whether to participate in research projects. In addition, support was obtained from the vision organisations involved.

Recruitment procedures adhered to NHMRC ethics principles: participants were approached indirectly, contacted the researcher themselves to volunteer and vision agencies were not informed who participated (NHMRC, 2005). Adult participants provided voluntary, informed consent via written information sheets and consent forms, which were available in alternative-to-print format (Appendixes J.3, K.3, L.3, N.3). Parents and/or guardians gave consent for the participation of their children, and were informed that a child's refusal to participate would be respected (NHMRC, 2005). All participants were informed of their right to withdraw participation without prejudice.

NHMRC data storage procedures were adhered to (NHMRC, 2005). All de-identified raw data and consent forms were stored separately in a locked storeroom in the research centre at the Curtin University School of Occupational Therapy. The personal information was stored separately in a locked cabinet in the researcher's office. Electronic data were secured via password access, with back-up copies stored on disk in a locked cabinet separate to the computer. All data will be kept securely stored for a minimum of seven years.

4.7 MEASUREMENT TOOLS

The ten stakeholder factors were measured using seven tools (Table 4.1), including four standardised assessments:

1. SSRS (Social Skills scale)(Gresham & Elliot, 1990);
2. Teacher Opinion Questionnaire (Larrivee & Cook, 1979);
3. Quality of Inclusive Experiences Measure (QuIEM) (Wolery et al., 2000) (Program Goals and Purposes, Staff Support and Perceptions, Individualisation, Accessibility and Adequacy of the Physical Environment, Adult-Child Contacts and Relationships scales); and
4. Parent Involvement Questionnaire (Winton & Turnbull, 1981).

Three researcher-designed measurement tools were also used:

1. Teacher Demographic Questionnaire (including Teacher Experience and Training items) (Appendix Q);
2. Administrator Demographic Questionnaire (demographic information only) (Appendix R); and
3. Family Demographic Questionnaire (including Early Intervention item) (Appendix S).

The outcome variables were assessed with the QuIEM (Participation and Engagement scale) and the SSRS (Academic Competence scale) (Table 4.1).

Table 4.1. Measurement tool description, by stakeholder factor and outcome

Variable	Instrument and scale or item	Scale or item description	Available scale normative data
	Stakeholder factors		
Social skills	SSRS (Teacher Elementary Form) Social Skills scale	Teacher rated questionnaire	*n* = 1,033 US preschool and elementary non-handicapped and handicapped children
Early intervention	Family Demographic Questionnaire Early Intervention Item	Parent rated questionnaire	Researcher designed scale. Face validity obtained.
School attitude			
Teacher only	Teacher Opinion Questionnaire	Teacher rated questionnaire	Criterion referenced
Whole school	QuIEM		
	Program Goals & Purposes scale	Teacher and principal rated questionnaire, interview and document review	Criterion referenced. Researcher operationalised.
Staff support	QuIEM		
	Staff Support & Perceptions scale	Teacher and principal rated questionnaire	Criterion referenced.

(table continues)

Table 4.1. ***(continued)***

Variable	Instrument and scale or item	Scale or item description	Available scale normative data
	Stakeholder factors		
Individualisation	QuIEM		
	Actual Individualisation Items	Teacher interview & worksheet	Criterion referenced. Researcher operationalised. ICC rating.
Physical accessibility	QuIEM		
	Accessibility & Adequacy of the Physical Environment scale	Observer rated scale	Criterion referenced. Researcher operationalised. ICC reliability rating & face validity obtained.
Adult involvement	QuIEM		
	Adult-Child Contacts and Relationships scale. Adult Involvement Item	Observer rated item	Criterion referenced. Researcher operationalised. ICC reliability rating obtained.
Teacher knowledge & training	Teacher Demographic Questionnaire Teacher knowledge & experience scale	Teacher rated questionnaire	Researcher designed scale. Face validity obtained.
Vision aides and equipment	Teacher Demographic Questionnaire Vision aides & equipment scale	Teacher rated questionnaire	

Table 4.1 ***(continued)***

Variable	Instrument and scale or item	Scale or item description	Available scale normative data
	Stakeholder factors		
Parent involvement	Parent Involvement Questionnaire	Parent rated questionnaire	Criterion referenced
	Outcome variables		
Participation	QuIEM		
	Participation Scale	Observer-rated scale	Criterion referenced. Researcher operationalised. ICC reliability rating attained.
Engagement	QuIEM		
	Engagement Scale	Observer-rated scale	
Child Interaction	QuIEM		
	Child-child Contacts and Relationships Scale	Observer-rated scale	
Academic Competence	SSRS (teacher version elementary)	Teacher rated questionnaire	n = 1,033 US non-handicapped and handicapped children
	Academic Competence Scale		

Note. QuIEM = Quality of Inclusive Experiences Measure; SSRS = Social Skills Rating System; ICC = Intra-class correlation.

Different scales of some of the measurement tools were used to measure separate variables. In particular, six scales of the QuIEM measured five independent variables and two outcome variables; and two scales of the SSRS measured one independent variable and one outcome variable. While this does pose some limitations to the study (see section 7.4.3), the scales used each measured separate constructs. While there was overlap of one item among two of the QuIEM scales, all other items were mutually exclusive. However, previous research has used the SSRS (Hood, 2005) and QuIEM (Odom & Buysse, 2005) in similar ways, with instrument scales measuring both independent and outcome variables. The SSRS subscales have been tested for psychometric properties, independent of the total (section 4.7.2 Social skills and 4.7.3 Academic performance). Finally, no total QuIEM or SSRS instrument scores were used in this study, only scale or item scores.

Because common measurement tools were used, each scale used is discussed in turn, under the heading of the variable that it measured. The overall format, procedure and psychometric properties of each measurement tool will be discussed on its first mention.

4.7.1 Demographic Information

Three demographic questionnaires were designed by the researcher. The Teacher Demographic Questionnaire collected demographic information about the teacher and classroom; and the Administrator Demographic Questionnaire focused on the school principal or program administrator. The 21 item Family Demographic Questionnaire obtained information about the child's vision and co-existing disability status and socio-demographic family factors. This tool was adapted from existing questionnaires (Bennet, 2003; Christian et al., 1998; Ferguson et al., 2001).

4.7.2 Stakeholder Factors

Social skills: Social skills were measured using the SSRS Teacher Version (Elementary Form). The SSRS has three scales: (1) social skills, (2) problem behaviours, and (3) academic performance (Gresham & Elliot, 1990). In this study, the Social Skills scale was used to elicit teacher ratings of children's classroom social behaviours and adaptive functioning (Gresham & Elliot, 1990). The thirty item questionnaire asks teachers to rate the frequency of children's social behaviours on a three-point Likert scale (never, sometimes, or very often). The Social Skills scale is comprised of four sub-scales: (1) Self-Control, (2) Responsibility, (3) Assertion and (4) Cooperation. Sub-scale scores are summed for a total Social Skills score (ranging 0 - 60), and converted to behavior levels [sic] (*fewer*, *average*, or *more*) based on US norms. High scores on all scores indicate positive social skills.

The SSRS is widely recognised in the early intervention field: it is the most frequently used questionnaire of child social skills and demonstrates some of the strongest psychometric properties of social scale instruments (Basca, 2002). The SSRS Teacher Version (Elementary Form) demonstrated good reliability and validity in testing of 1,033 children with and without disabilities in the US (Gresham & Elliot, 1990). The median coefficient alpha for internal consistency were excellent for the Teacher Elementary Form (.94 for Social Skills, .88 for Problem Behaviours and .95 Academic Competence) and temporal stability of teacher ratings over a four week period demonstrated test-retest reliability correlations of .85 found for Social Skills, .84 for Problem Behaviours, and .93 for Academic Competence scales. Inter-rater reliability has not been assessed. The validity (content, criterion and construct) of the SSRS is well documented by Gresham and Elliot (Gresham & Elliot). The SSRS Teacher Version correlates highly with the Social Behaviour Assessment (which assesses problem behaviours), the Child Behavior [sic] Checklist (CBCL) Problem scale (Achenbach & Edelbrock, 1983) and the Harter Teacher Rating Scale (Harter, 1986).

The SSRS has been used in numerous large-scale, longitudinal Australian studies to measure the social skills of pre-school and primary school aged children both with (B. Barton & North, 2003; Bennet, 2003; Choi, 2000) and without disabilities (Bowles et al., 2004; Margetts, 2000a, 2000b). In addition, the SSRS has been used successfully to compare the social and academic skills of children with vision impairment to their classmates in Australia (Telec, 2001) and the US (Buhrow et al., 1998). It was concluded that "the age range of the SSRS and ecological nature of the scale makes it particularly useful for such studies of children with various degrees and types of vision loss" (Buhrow et al., 1998, p. 511). The SSRS items do not depend on visual behaviours, gestures or non-verbal visual communication. Thus the SSRS was deemed appropriate to assess children with vision impairment

Handicapped [sic] and non-handicapped elementary age group norms (preschool [sic] to grade 6) are provided for each gender. Only non-handicapped norms were used in the present study to enable comparison of children with vision impairment with typically developing children. The absence of items addressing stereotypical behaviours common to children who are blind in the Problem Behaviors [sic] scale poses the only concern in applying the SSRS to this population (Buhrow et al., 1998). However, the Problem Behaviours scale was not used in this study because stakeholder groups described adaptive social skills when generating the variable, not maladaptive or problem behaviours.

The SSRS is not sensitive to subtle developmental changes in social skills or academic competence unless the same rater assesses children from varying points on the developmental sequence (Gresham & Elliot, 1990). In the present study, the same rater (teacher) was used where possible during the first year. However all raters in the second year were different. Thus, the researcher was cognisant that improvement in children's social skills ratings (indicating development) may not be evident.

Finally, since teachers were given numerous questionnaires to complete, a multi-purpose, succinct questionnaire was sought to increase the completion rate. The SSRS met this criterion, but other instruments such as The Vineland Adaptive Behavior Checklist (Sparrow, Balla, & Cicchetti, 1984), while valid, were exhaustive and assessed only one stakeholder factor construct.

Early intervention: Level of early intervention was rated by parents on the researcher designed Family Demographic Questionnaire. Parents indicated the total number of months (ranging from 0-36 months) of early therapy and/or education intervention their child received prior to the age of three. This item underwent face validity testing (see section 4.11).

Teacher attitude: Two aspects of the stakeholder factor Inclusive Attitude were measured separately: (1) teacher attitude and (2) school attitude towards inclusion. The Teacher Opinion Questionnaire (Larrivee & Cook, 1979) measured teacher attitude towards statements about inclusion. Using a five point Likert-style scale (strongly agree to strongly disagree) the Teacher Opinion Questionnaire provides a summative score, with high values representative of a positive teacher attitude (Larrivee & Cook, 1979). A score above the midpoint of the score range was considered above average (Hudson & Clunies-Ross, 1984). Items included the benefit and detriments of inclusion on students with and without disabilities, behaviour management, teacher ability and workload.

Original testing of the Teacher Opinion Questionnaire with 941 U.S. teachers determined a split-half reliability of .92 by Spearman-Brown reliability coefficient (Larrivee, 1981). Further testing verified reliability and validity (Green, Rock, & Weisenstein, 1983), however it was reported likely that the five-factor structure was biased due to the sample factors (Larrivee, 1982). Psychometric properties have since been reported and the measure has been modified for the Australian context (Bennet, 2003; Hudson & Clunies-Ross, 1984; Roberts & Zubrick, 1992). The original five-factor structure did not provide satisfactory fit among teachers of 212 Australian children using confirmatory factor analysis (Bennet, 2003). Instead, a 15-item, three factor model consisting of: (a) General Attitudes; (b) Teacher Ability; and (c) Social Ability, demonstrated moderate acceptance (χ^2 = 224.28, *df* = 82, Root mean square error approximation = .09, goodness-of-fit index = .88, adjusted goodness-of-fit index = .82, Bollen's incremental fit index = .89), and strong overlap between the factors (General Attitudes correlated .54 with Teacher Ability, and .60 with Social Ability; Teacher Ability and Social Ability correlated .75) (Bennet, 2003). The overall measure (.92) and each of the three modified factors had a high reliability (General Attitudes .79, Teacher Ability .73, and Social Ability .70). The measure showed high internal consistency and was deemed a suitable measure of teacher opinion towards inclusion. Thus, the modified 15-item version was used in the current study.

School attitude: The Program Goals and Purposes scale of the QuIEM was used to measure school attitude towards inclusion. The overall properties of the QuIEM (Wolery et al., 2000) will be described in this section, followed by details of the Program Goals and Purposes Scale.

The QuIEM measures practices that promote positive outcomes for young children with disabilities in early education settings (Wolery et al., 2000). It consists of seven scales that rate the quality of the program and educational experience: (1) Program Goals and Purposes; (2) Staff Supports and Perceptions; (3) Individualisation of Goals, Planning and Implementation; (4) Accessibility and Adequacy of the Physical Environment; (5) Adult-child Contacts and Relationships, 6) Participation and Engagement; and (7) Child-child Contacts and Relationships. All QuIEM scales were used in this study (Table 4.1).

The QuIEM scales are administered via several methods: questionnaire, structured interview, review of documentation and/or observation. Observation of classrooms is used extensively and the QuIEM manual provides instructions for implementation. It is recommended that scales utilising observation are completed concurrently during an observation time of at least three hours over two days, during a variety of natural classroom activities. The tool evaluates classes rather than whole programs or schools, thus allowing for comparison of participants attending different classes in the same school (Wolery et al., 2000).

Most QuIEM items (with the exception of questionnaire and Participation items) are rated on five-point categorical descriptive scales according to the scoring manual. Questionnaire items range from four to six-point scales, and the Participation Scale is scored using a percentage. Items are summed to obtain a total scale score: higher scores indicate a more positive condition. Total scale scores are converted to quality levels for each scale: (a) *very poor* (39% of less of the total possible score), (b) *poor* (40-59% of the total possible score) (c) *mediocre* (60-79% of the total possible score), (d) *good* (80-89% of the total possible score), or (e) *excellent* (90-100% of the total possible score) (Wolery et al., 2000).

The QuIEM does not have normative data. It was developed on theoretical assumptions and extensive literature review regarding child development through interactions with the environment; the practice of inclusive programs and the needs of children with disabilities (Wolery et al., 2000). Furthermore, psychometric data are not available (M. Wolery, personal communication, July 7, 2004). Despite this, the use of the measure was justified by several critical advantages: (a) standardisation, (b) observation of actual behaviours, (c) the existence of quality ratings, and (d) the multipurpose nature of the tool (see section 7.3.3). When compared to interviews and questionnaires only, structured observation provides more reliable information about events; and greater precision regarding their timing, duration and frequency (Bryman, 2004; McCall, 1984).

In addition, the QuIEM is one of the few existing tools to measure the adequacy of inclusive programs. While instruments such as the Early Childhood Environment Rating Scale – Revised (Harms, Clifford, & Cryer, 1998) and the Preschool Assessment of the Classroom Environment Scale – Revised (Raab & Dunst, 1997) measure aspects of programs that are thought to exemplify high quality for typically developing students, they do not focus on variables that are likely to influence the outcomes of children with disabilities. The QuIEM has been used in previous research to assess the quality of community-based, Head Start, and public school programs for children with disabilities in the US (Odom & Buysse, 2005).

None of the QuIEM items credit visual behaviours of students. Items in the Accessibility and Adequacy of the Physical Environment sub-scale were modified to apply to the specialised visual needs of students with vision impairment. Face validity testing and pilot testing deemed that the modified QuIEM was appropriate for use with students with vision impairment (section 4.10-4.13). Finally, efforts were made to further standardise and objectify the measurements, particularly the observation-based scales.

The QuIEM Program Goals and Purposes scale measured school attitude towards inclusion. It is comprised of 18 items that are collected via three methods: (1) review of school mission and vision documentation (the incorporation of inclusive ideals in the school), (2) semi-structured interviews with principals and teachers (to determine understanding of the school and personal philosophy of inclusive ideals); and (3) two seven-item questionnaires completed by teacher and principal (to rate understanding of the school philosophy and personal importance of inclusive education). The researcher rated the documentation and interviews on five point Likert scales. Scores were summed to obtain a total Program Goals and Purposes Scale score, that was converted to a quality rating for each program.

Staff support: The QuIEM Staff Supports and Perception Scale measured adequacy of support provided to staff (Wolery et al., 2000). Two 12-item questionnaires (teacher and principal rated) assessed staff perception of the extent to which support required by classroom staff are available, through the principal (for training, planning time, materials etc.), specialists, families and staff interactions within the classroom. Teacher and principal questionnaires are summed for a Total Supports and Perception score which is converted to a Quality rating.

Individualisation of the curriculum: The QuIEM Individualisation Scale assessed the accessibility and level of individualisation of the curriculum for children with vision impairment. The scale comprised of three components: (a) Goals, (b) Plan of Implementation and (c) Actual Implementation (Wolery et al., 2000). The former scales were based on a review of Individual Education Plan documentation. While formulation of these plans are considered good practice in Australia, they are not compulsory, as they are in the US under the IDEA legislation. The formulation of an Individual Education Plan is at the discretion of schools and parents. In pilot testing, it was discovered that a lot of schools do not make these plans, and those that do generally formulate the Individual Education Plan well into the school year. As such, it was highly likely that most classes would not have Individual Education Plan documentation at Time 1, which would reduce the sensitivity of the instrument. For these reasons, only the *Actual Implementation* sub-scale was used to measure in this study.

The researcher rated six items based on a structured teacher interview: teacher's report of (1) activities, routines or transitions used for teaching goals; (2) use of distributed instruction (promoting acquisition of each goal more than one time per day); (3) extent to which all daily activities are used to teach some goal; (4) strategies, procedures or environmental arrangements used to teach goals; (5) staff responsibility for teaching goals; and (6) implementation of generalisation plans. Quality ratings were calculated based percentages of the total possible Actual Individualisation score. This scale applied only to children with vision impairment; not classmates.

Physical environment: The adequacy of the physical school environment for the child with vision impairment was measured using the Accessibility and Adequacy of the Physical Environment Scale of the QuIEM (Wolery et al., 2000). This scale is measured via direct researcher observation of the school and classroom environment. Five items measure the adequacy of (a) classroom equipment and environment, (b) materials, (c) participation of the child with disabilities in classroom areas, (d) the self-care area, and (e) the playground and outside play for the child with vision impairment. The self-care item was not used in this study (see Operationalisation). As such, Quality levels were determined by percentage of the total possible four-item score (outlined previously).

Adult involvement: One item within the Adult-Child Contacts and Relationships Scale of the QuIEM measured the stakeholder factor Adult Involvement. The Adult-Child Contacts and Relationships scale is researcher-rated, comprising of three items: (1) level of adult involvement (uninvolved, minimally involved, adequate, over involved or excessively involved); (2) nature of adult interaction (positive, neutral or negative); and (3) adult response to the child and elaboration of behaviour (Wolery et al., 2000). The level of adult involvement item was used in this study. This item involved direct observation of child interactions with all adults (teachers, education assistants, parents, volunteers) in the classroom. The Adult Involvement item was ranked according to the following levels: uninvolved or excessively involved; minimally or over involved; or appropriately involved. A quality score was not attained; instead level of involvement was used. This item was operationalised (see section 4.10).

Vision aides and equipment: The stakeholder factor, Vision Aides and Equipment, was assessed using the teacher-rated Teacher Demographic Questionnaire. Four items, each rated on a five-point categorical scale, measured classroom vision specific resources that were recommended for the child with vision impairment. They were rated for (1) availability in the classroom, (2) timeliness of access, (3) staff training and (4) student training in the use of the equipment. A summed total score was attained (out of 20), with higher scores indicating more adequate access to vision aides and equipment. The items were not rated for children who were not recommended specialised equipment.

The scale was designed based on clinical literature (Arter et al., 1999; Best, 1992; Douglas, 2001; Gale & Cronin, 1998; Mayfield et al., 1996) and items underwent face validity testing (see section 4.11).

Teacher training and experience: Five items in the Teacher Demographic Questionnaire elicited information about teacher training and experience. The items, each rated on a weighted four-point categorical scale, measured the amount of training teachers had received about vision impairment or inclusive education through (a) bachelor level units, (b) postgraduate level units, and (c) professional development; as well as previous experience teaching students with (d) vision impairment and (e) other disabilities. Items relating to vision impairment were given a stronger weighting than those relating to general inclusion. A total summed score was attained (ranging from zero to 30), with high scores indicating more experience and training specifically related to children with vision impairment. Item content was dictated by NGT group results, input from an experienced early education teacher and academic, and a review of literature (Jobe et al., 1996; Norman et al., 1998; Soodak et al., 1998; Wall, 2002); and face validity ratings were attained for content and scoring.

Parent involvement: Amount of parent involvement was measured using the Parent Involvement Questionnaire (Winton & Turnbull, 1981). This tool was developed with parents of children with disabilities to measure their involvement in preschool programs (Winton & Turnbull, 1981). On the eight-item questionnaire, caregivers rate whether they are currently involved in aspects of their child's educational program: in activities within and outside of class, policy board, parent training and counselling opportunities, informal contact with teachers, helping others understand child's special needs (if any) and playing a role in the child's school. Items are rated on a three-point Likert scale (*no, maybe*, *yes*), with a *not applicable* option. An average score of applicable items was calculated (ranging between one and three), with higher scores indicating greater involvement.

In an evaluation with 212 Australian families with and without disabilities, two items with low squared multiple correlations were removed from the scale, resulting in a uni-dimensional model with acceptable statistics ($\chi^2 = 2.61$; $df = 4$; root mean square error approximation = .00; goodness-of-fit index = .99; adjusted goodness-of-fit index = .98; Bollen's incremental fit index = 1.00) (Bennet, 2003). The modified questionnaire displayed a high level of internal consistency, with confirmatory factor analysis producing a reliability score of .71 and Cronbach's alpha coefficient of .73 (Bennet, 2003). Given these findings, the current study used only the six acceptable items.

4.7.3 Outcome Variables

Participation: The Participation and Engagement Scale of the QuIEM measured two outcome variables: (1) Participation, the extent to which children participated in typical class (with at least one other student) activities, routines and transitions; and 2) Engagement, the extent to which they were engaged in activity (attending, performing tasks, not disrupting). A child could be participating in a classroom activity (for example, present during a lesson), but relatively disengaged in the task (not performing any part of the task, not attending to the task). Conversely, a child could be not participating in a classroom activity (i.e. involved in a separate activity to the rest of the class), but highly engaged in the activity.

Both sub-scales involved direct researcher observation (using interval recording) of children over at least a two-hour block of time during a number of different class activities (including meal time). During each interval, children were rated as either *participating* (involved in an activity, routine or transition which at least one other child is also involved in) or *not participating* in classroom activities (alone or with an adult only) for at least 50% of the time. An overall percentage of participation score and quality of participation was obtained.

Engagement: For the Engagement sub-scale of the QuIEM, the researcher rated children on a five-point scale for each observation interval, based on the amount of time spent actively engaged in activity (as opposed to non-engaged, waiting or behaving inappropriately) according to the engagement rating scale key. The higher the score, the more engaged a child was in activity. An average Engagement score and quality were calculated.

Child interaction: The QuIEM Child-Child Contacts and Relationships Scale assessed the outcome variable Child Interaction, measuring interactions between the child and his/her classmates during a variety of activities, transitions and routines in which child-child interactions are appropriate and desirable (e.g. snack, outdoor play, group activities, free time but not activities with a high degree of teacher direction). Interactions were any contacts that one child had with another, including verbal or non-verbal behaviour (Wolery et al., 2000). During each observation interval, the frequency of five items were recorded: (1) nature of interactions (frequency of positive, neutral and negative affect), (2) frequency of interactions (presence or absence of interaction during each interval), (3) initiator of interactions (frequency of interactions initiated by observed child as opposed to other children), (4) reciprocity of interactions by the observed child, and (5) reciprocity of interactions by other children (frequency of reciprocation of interaction by the observed child and classmates). These tallies were then rated according to the scoring instructions.

Academic performance: The SSRS (Teacher Version, Elementary Form) Academic Competence scale obtained teacher ratings of children's classroom academic performance. The Academic Competence Scale contains nine items; five of which measure pure academic performance (overall performance, reading and mathematics). The remaining four items assess child motivation and parental encouragement to succeed academically, intellectual functioning, and overall classroom behaviour (Gresham & Elliot, 1990). On a five-point Likert scale, teachers rate the student relative to his or her class peers (lowest through to highest ten percent). Items are summed for a score (ranging from nine to 45), with higher scores indicating greater academic performance. Scores can then be converted to behaviour level (*below average, average, above average*).

The SSRS Academic Competence scale has demonstrated excellent psychometric properties: with internal consistency of .95 and test-retest reliability of .93 reported (Gresham & Elliot, 1990). The scale has a moderately high negative correlation with the Child Behaviour Checklist Total Behaviour Problem Score (-.59) as would be predicted by a strong relationship between social skills and academic competence.

Since the teachers rate student academic competence relative to the classmates within each grade, children with and without vision impairment can be compared against each other on an equal scale (Buhrow et al., 1998). This rating relevant to other students also means that change is not expected in mean raw scores on the Academic Competence scale from grade to grade (Gresham & Elliot, 1990). Results from construct validity testing revealed that mean scores did not show a consistent pattern across the grade levels (Gresham & Elliot, 1990). Finally, this rating format ensures consistency of academic ratings across Australian states, as the items do not depend on curriculum outcomes or grading systems, which vary among Australian states.

4.8 DATA COLLECTION PROCEDURES

Data collection procedures were replicated at each point in time. The first data collection period commenced eight weeks after the start of the school year (either in 2005 or 2006 depending on participant sample, see section 4.3). The second and third data collection periods commenced in the first week of term four, one year apart. Questionnaires were mailed to parents (Parent Involvement Questionnaire and Family Demographic Questionnaire), teachers (SSRS, QuIEM Teacher Questionnaire, Teacher Opinion Questionnaire and Teacher Demographic Questionnaire) and principals (QuIEM Administrator Questionnaire) at the commencement of each data collection period, and participants were asked to complete the questionnaires during a specified week. Participants with unreturned questionnaires were followed-up by letter and phone call for up to six weeks following the due date.

The researcher spent one day at each class during each data collection point. The visit was arranged on a *typical* class day (i.e. a day that included specialty lessons such as art or physical education but excluded excursions etc.). During this day, the researcher completed several tasks; (a) conducted the QuIEM teacher and principal interviews, (c) collected school mission and goal statements, (d) collected the completed teacher and principal questionnaires, and (e) conducted the QuIEM classroom observations. The researcher conducted all observations, interviews and document reviews; and a trained research assistant was present for 45% of the Time 1 visits for inter-rater reliability testing (see section 4.12 and 4.12).

The Time 1 visits were conducted an average of 10.7 weeks after the relevant state's school commencement date (SD = 2.8 weeks); Time 2 visits occurred an average of 6.4 months later (SD = 0.5 months), followed by Time 3 visits 11.1 months after that (SD = 0.4 months). While the Time 1 school visits spanned a period of six weeks (accounting for school holiday breaks), the Time 2 and Time 3 visits each spanned three weeks.

4.9 ANALYSIS

Non-parametric analysis was employed throughout the study for two reasons. Firstly, the assumptions of population normality and homogeneity of variance could not be satisfied due to the small sample size and ceiling and floor effects found in the data (reflecting the high performance of classmates and wide variance amongst children with vision impairment). Secondly, some data were measured on ordinal scales (Portney & Watkins, 2000). Descriptive statistics were computed for all variables of interest and are expressed as median (*Mdn*) and inter-quartile range (*IQR*). These statistics are appropriate ways to express the results of the ranked tests that were used. Categorical data are expressed in percentage and number of participants. All *p* values reported are exact, unadjusted, two-tailed, and subject to a significance level of 5%.

4.9.1 Situation that Children with Vision Impairment are Exposed to in Regular Early Education

The first aim of Phase 2 was to describe the situation that children with vision impairment are exposed to in regular early education. This was done by analysing the stakeholder factors during the period of two years, according to: (1) adequacy of the situation, (2) differences between groups, and (3) temporal change.

The *adequacy* of the situation was described the categorical levels of the stakeholder factors experienced by children with vision impairment at each point in time. Adequacy was determined by *good* and *poor* cut-off levels of each instrument scale (see section 4.9.3). Mann-Whitney *U* Tests determined significant differences in the median score of each stakeholder factor between groups of children with and without vision impairment (Table 4.2). Fisher's Exact Tests analysed categorical data to support findings.

Wilcoxon Signed Ranks Test analysed changes that occurred over time among the student (Activity Performance factors), teacher or class (Environmental factors) raw scores. These results were supported by McNemar analysis of categorical data. Two teachers unexpectedly changed during the first school year, so sensitivity analysis was conducted on the teacher rated variables: social skills, school attitude, teacher

Table 4.2. Variables analysed to compare children with and without vision impairment

Stakeholder factor	Comparison between groups with and without vision impairment		
	Time 1	Time 2	Time 3
Activity Performance			
Social Skills	√	√	√
Personal Factors			
Early Intervention	√		
Environmental factors			
School attitude			(√)
Teacher attitude			(√)
Support for Teacher			(√)
Teacher Training and Knowledge			(√)
Physical Accessibility			
Individualisation			
Vision aides and equipment			
Adult Involvement	√	√	√
Parent Involvement	√	√	√

Note. √ = factors were analysed between children with vision impairment and classmates; (√) = factors were analysed between classes of children with vision impairment and 'classmates only'.

attitude, staff support, teacher knowledge and experience, adult involvement and individualisation. Where no differences were found, total sample results were reported. Where different results were found, these differences have been reported.

Most of the Environmental factors measured classroom elements common within participant 'clusters' (participants with vision impairment and their respective participating classmates); thus they were not compared between-groups during the first year. However, at the end of the second year many of the participant clusters attended separate classes. Differences in classroom environmental factors were compared between classes with students with vision impairment and classes that contained 'classmates only'.

4.9.2 Inclusive outcomes of children with and without impairment

The second aim had three components: to describe, and to compare the performance of children with and without vision impairment at each point in time, and to identify whether their performance changed over time.

Categorical data described the performance of the participants. Mann-Whitney U Tests compared differences between the median Participation, Engagement, Child Interaction, and Academic scores of children with vision impairment and their classmates. These comparisons were illustrated using Fisher's Exact Tests.

Wilcoxon Signed Ranks Tests determined if the median performance of children with vision impairment or classmates changed between each point in time (i.e. from Time 1 to Time 2 and Time 2 to Time 3). Again, categorical analysis, using McNemar Tests supported these findings.

Finally, the *overall inclusion* of children with and without vision impairment was compared at each point in time. To do so, an Inclusion Index was created for each child at each time period. The Index combined the dichotomous ratings of participation, engagement, child interaction and academic performance into an ordinal scale that indicated the number of *good* outcomes achieved. Scores ranged from zero (no *good* outcomes) to four (*all* outcomes were *good*). Descriptive analysis was then undertaken, to compare the proportion of children with and without vision impairment with high and low Inclusion Index scores.

4.9.3 Factors that Influence the Inclusive Outcomes of Children with Vision Impairment

The third aim had two objectives. The first objective was to identify individual factors that influence the inclusive outcomes of children with vision impairment, relative to classmates. While Phase 1 identified factors that stakeholders *perceived* influenced the outcomes of students with vision impairment, their *actual* influence was unknown. In order to determine whether the factors predicted outcomes, it was necessary to firstly select the significant factors from the top-ten stakeholder factors. A systematic decision process was followed to select individual predictors of success for children with vision impairment within one year, then two years later.

Experts have called for novel methodologies to more comprehensively explore the individual variation among children with vision impairment and the antecedents of their outcomes; describing research that simply compares the performance of children based on the diagnosis of vision impairment as inadequate (Kirchner, 2000; Warren, 2000). In this study, the performance of children was compared based on the conditions that they were exposed to at the start of the first year, as well as their impairment status. This enabled an examination of the factors that influence the variation in success among all participants.

Specifically, data were coded dichotomously to form four groups for each Time 1 stakeholder factor: children with vision impairment in a (1) *poor* or (2) *good* stakeholder factor condition; and classmates in a (3) *poor*, or (4) *good* stakeholder factor condition. Data were coded based on measurement tool criteria. When this criterion did not exist, the score that divided *above neutral* responses and *neutral* or *less than neutral* responses was used to denote *poor* and *good* conditions. For clarity, the terms *more* and *less* were used when the labels *good* and *poor* were not appropriate (i.e. for the variables early intervention, severity of vision impairment and co-existing disability status) (Table 4.3). The level g*ood* also denotes adequate situations. Note that Individualisation was coded differently. Since there were no classes with *mediocre*, *poor*, or *very poor* Individualisation, a different coding was necessary to investigate the effects (if any) of variation in Individualisation level. *Good* quality Individualisation denoted a *poor* situation and *excellent* quality Individualisation denoted a *good* situation.

Furthermore, to address the heterogeneity among children with vision impairment and to avoid ignoring blatant differences within the sample, demographic factors (vision impairment severity, co-existing disability status, socio-economic status) were examined as potential predictors in addition to stakeholder factors. Children with vision impairment and, when relevant, classmates were grouped according to these dichotomous demographic factors.

Table 4.3. Cut-off levels for dichotomous grouping of stakeholder factors, outcome variables and demographic variables by measurement tool

Measurement tool	Cut-off levels for dichotomous groupings	
	Level of *poor* or *more* [a]	Level of *good* or *less* [a]
	Stakeholder and outcome variables	
Quality of Inclusive Experiences Measure		
Program Goals & Purposes Scale	Quality = *very poor, poor, mediocre*	Quality = *good, excellent*
Staff Support Scale	Quality = *very poor, poor, mediocre*	Quality = *good, excellent*
Participation & Engagement Scale	Quality = *very poor, poor, mediocre*	Quality = *good, excellent*
Child-Child Contacts & Interaction Scale	Quality = *very poor, poor, mediocre*	Quality = *good, excellent*
Adult Involvement Item	Involvement Level = *uninvolved, minimal, over* or *excessive involvement*	Involvement Level = *appropriate*
Actual Individualisation	Quality = *good*	Quality = *excellent*
Social Skills Rating System		
Social Skills Scale	Behavior Level = *below average*	Behavior Level = *average, above average*
Academic Competence Scale	Behavior Level = *below average*	Behavior Level = *average, above average*
Parent Involvement Questionnaire	Average = 1-2	Average = 2-3

(table continues)

Table 4.3. ***(continued)***

Measurement tool	Cut-off levels for dichotomous groupings	
	Level of *poor* or *more* [a]	Level of *good* or *less* [a]
	Stakeholder and outcome variables	
Teacher Demographic Questionnaire		
Vision Aides & Equipment Scale	Sum Score = 1-12	Sum Score = 13-16
Teacher Training & Experience Scale	Sum Score = 5-10	Sum Score = 11-20
Family Demographic Questionnaire		
Early Intervention Item	Child received early intervention	Child did not receive early intervention
Teacher Opinion Questionnaire	Sum Score = 15-52	Sum Score = 53-75
	Demographic variables	
Family Demographic Questionnaire		
Co-existing disability	Child had a disability other than vision impairment	Child did not have a disability other than vision impairment
Socio-economic status	Annual family income pre tax < $60, 000	Annual family income pre tax > $60, 000
Vision impairment severity	Severe visual impairment [b]	Moderate visual impairment [c]

[a] The terms *more* and *less* were used when the labels *good* and *poor* were not appropriate (i.e. for the variables early intervention, severity of vision impairment, co-existing disability status and socio-economic status).
[b] Severe visual impairment, best corrected visual acuity < 6/60 and/ or visual field < 10 degrees.
[c] Moderate visual impairment, best corrected visual acuity < 6/18 to 6/60 and/ or visual field < 20 to 10 degrees.

Finally, the outcome variables were also dichotomously coded (for use in univariate logistic regression). The same *good* and *poor* levels were used (Table 4.3). Throughout this thesis, the terms ‘success’ and ‘successful outcomes’ are used to describe outcomes that were of a *good* level. Conversely, the term ‘unsuccessful’ refers to outcomes that were of a *poor* level.

A decision process to select individual predictors for each outcome consisted of three steps: Step (1) univariate exact logistic regression, Step (2) within-group Mann-Whitney U Tests, and Step (3) differential between-group Mann-Whitney U Tests (Figure 4.1). Analysis was conducted separately for data over one year and data over two years. This systematic selection process ensured that only factors that produced significant results in *both* logistic regression (binary outcome data) and Mann-Whitney U Tests (raw outcome data) were considered as univariate predictors. The selection process ensured consistency and conservative interpretation of findings, which is important given the small sample size and variation within the data. The methods identified significant influences on the performance of children with vision impairment, relative to classmates. The selection process is described next.

Step 1: Exact univariate logistic regression: Exact univariate logistic regression was used as the preliminary screening step for the selection of factors. Logistic regression, like discriminant function analysis, analyses binary data (Dawson & Trapp, 2001). However, unlike discriminant function analysis, logistic regression requires no assumptions about the distribution of the independent variables: thus, they need not be normally distributed, linearly related or of equal variance in each group (Dawson & Trapp, 2001). The software program *LogXact* enabled exact analysis (Cytel Software, 2005).

Time 1 factors (stakeholder factors and demographic variables) that produced significant categorical differences in success, either (a) ‘within-groups’ (among the two groups of children with vision impairment in *good* and *poor* conditions) or (b) ‘between-groups’ (among groups of children with and without vision impairment in *good* and *poor* conditions) were selected for the next step. Factors that did not produce any significant differences were eliminated.

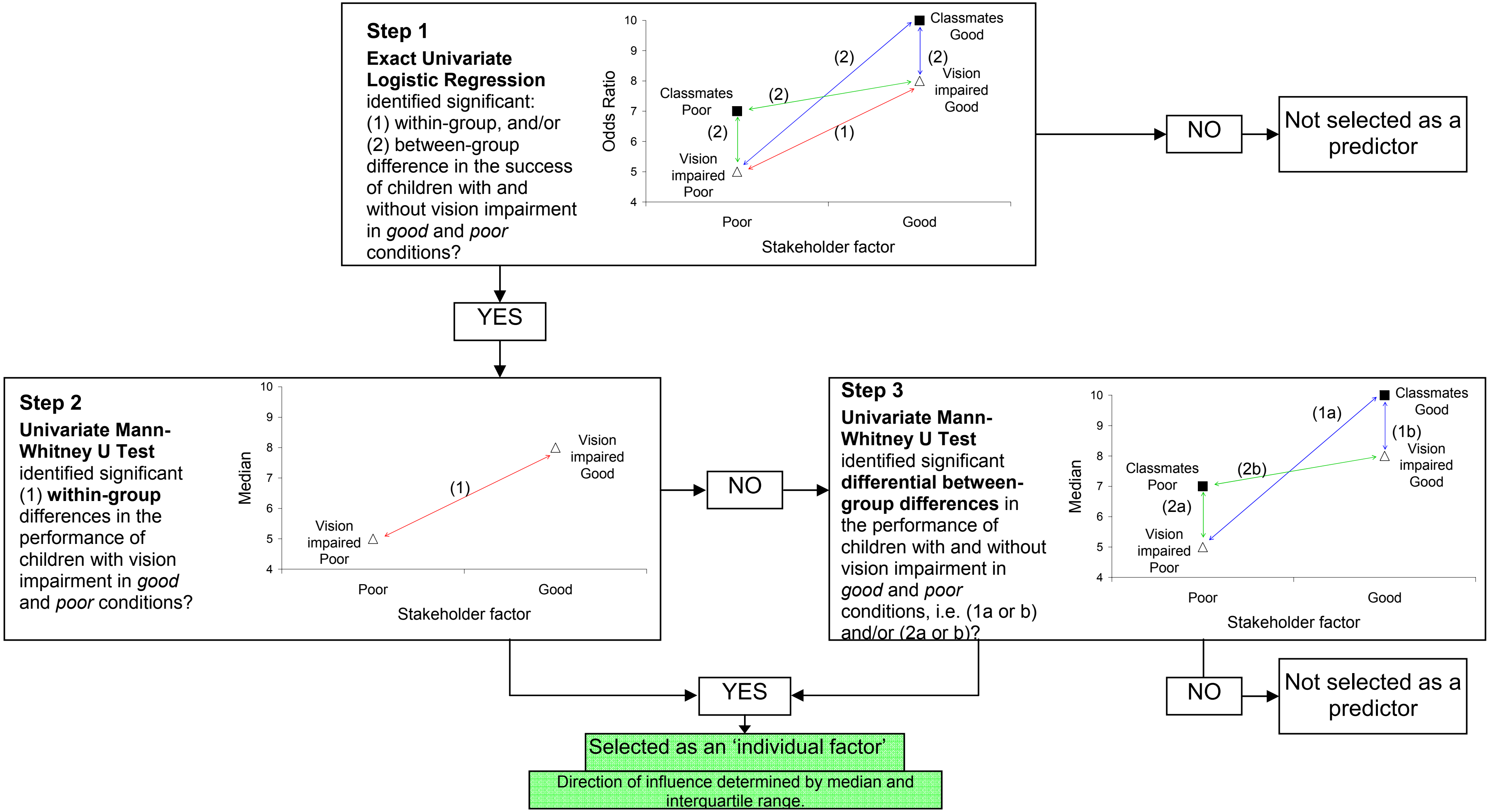


Figure 4.1. Three-step process to select individual factors that influence inclusive outcomes

Step 2: Mann-Whitney U Test (within-groups): Factors that produced significant univariate logistic regression results underwent Mann-Whitney Tests to compare the two groups of children with vision impairment. Factors that produced significant differences in median outcome scores of children with vision impairment in good and poor conditions were automatically selected as individual predictors. Factors that did not result in significant differences underwent the next step of analysis.

Step 3: Differential Mann-Whitney U Test (between-groups): Finally, factors that produced differential results in the between-group (i.e. between groups of participants with and without vision impairment) Mann-Whitney U Tests were selected as individual predictors. Differential results referred to either:

a. statistically significant difference between the outcomes of children with vision impairment in *poor* stakeholder factor conditions and classmates in *good* stakeholder factor conditions, but not between children with vision impairment in *good* stakeholder conditions and classmates in *good* stakeholder factor conditions (or vice versa); and/or
b. statistically significant difference between the outcomes of children with vision impairment in *poor* stakeholder conditions and classmates in *poor* stakeholder factor conditions but not between children with vision impairment in *good* stakeholder factor conditions and classmates in *poor* stakeholder factor conditions (or vice versa).

Individual predictors were identified for each outcome for children with vision impairment, over both one and two years. The direction of the predictor (i.e. negative or positive) was determined by the median scores and interquartile ranges.

It must be noted that this analysis identified only predictors of inclusive education outcomes for children with vision impairment, compared to the outcomes of classmates (a *typical* population). The analysis was replicated in an effort to determine the predictors of classmate outcomes. However the predictors were not meaningful, reflecting differences relative to the performance of children with vision impairment (a non-typical student population) rather than reflecting variance among other typically performing students. This was further verified when the individual classmate predictors were combined into a collective classmate factor (the process is described in section 4.9.3), which did not significantly predict success for any classmate outcome. Despite these non-significant findings, the focus of this research is children with vision impairment. Classmates were only used as a comparison group. The identification of individual predictors of classmate performance is beyond the scope of this thesis and, while major findings are considered in the discussion section, the results are not reported in detail in the results section.

4.9.4 How many Collective Factors are Required to Predict Success?

The final objective determined how many combined factors could predict successful outcomes for children with vision impairment and classmates over one and two years. Due to the small sample size and the large number of independent variables, it was not appropriate to fit a multivariate regression model to the data (Dawson & Trapp, 2001). Another important consideration was the utility of the results. This research sought to answer the research objectives in a way that was useful and meaningful for educators and policy makers. As a result, a novel analysis was used that took into account the context of education.

The predictive ability of a collective 'Index' was tested for each outcome. The concept of testing combined predictor indices is common in health research, particularly investigations into the effect of multiple risk factors on cardiovascular disease (Barefoot, Gronbak, Jensen, Schnohr, & Prescott, 2005; Katzmarzyk et al., 2004; Sung et al., 2007). In such research, the presence or absence of several categorical risk factors are combined to predict outcomes such as disease and mortality.

In this study, the individual factors that influenced outcome one and two years later were combined into a collective Index for each outcome. This resulted in four Indices: (1) a Participation Index, (2) an Engagement Index, (3) a Child Interaction Index, and (4) an Academic Index. The two years were combined for the sake of utility of results. It is less meaningful for educators to know the separate factors that influence performance one year later and two years later. The information that is more helpful to know about is the factors that influence student outcomes one *and* two years later.

Each of the Indices represented the number of individual factors that were present at the start of the first year of the study. For individual factors that positively influenced outcomes (determined in the previous three step process), a *good* or *less* condition indicated its presence. For negative predictor variables, a *poor* or *more* condition denoted its presence. A higher Index score indicated that more individual factors were present at the start of the first year. For example, an outcome Index score of *one* indicated that one of the individual factors was present at the start of the first year; *two* indicated that two factors were present, and so on. If an individual factor was not relevant to a participant (e.g. individualisation did not apply to classmates) it was not counted as present.

Two separate Indices were created for each outcome variable: (a) an Index comprised of significant stakeholder factors only, and (b) an Index comprised of significant stakeholder factors and significant demographic factors.

Receiver operating characteristic (ROC) curve analysis then determined the ability of the Indices to predict successful (respective) outcomes. For example, the ROC curve tested the ability of the Participation Index to predict successful participation was tested. ROC curve analysis has a variety of applications in the health field; particularly for identifying cut-off scores for diagnostic instruments (Perneczky, Pohl, Sorg, Hartmann, & Komossa, 2006; Portney & Watkins, 2000) or risk factor indices (Katzmarzyk et al., 2004) in order to predict diseased states, abnormal states, or mortality. ROC curves determine the efficacy of a continuous independent variable to predict a ‘positive’ or ‘negative’ state of a binary outcome variable (Portney & Watkins, 2000).

The ROC curves are constructed by plotting the sensitivity (true-positive rate) and specificity (true-negative rate) of the independent variable (Dawson & Trapp, 2001) (Figure 4.2). The shape of the ROC curve provides information about predictive accuracy. The closer the ROC Curve is to the diagonal, the less useful the variable is at discriminating between positive and negative states; while the more steeply the curve moves up and then across, the better the test. This shape is measured by the ‘area under the ROC curve’ (AUC).

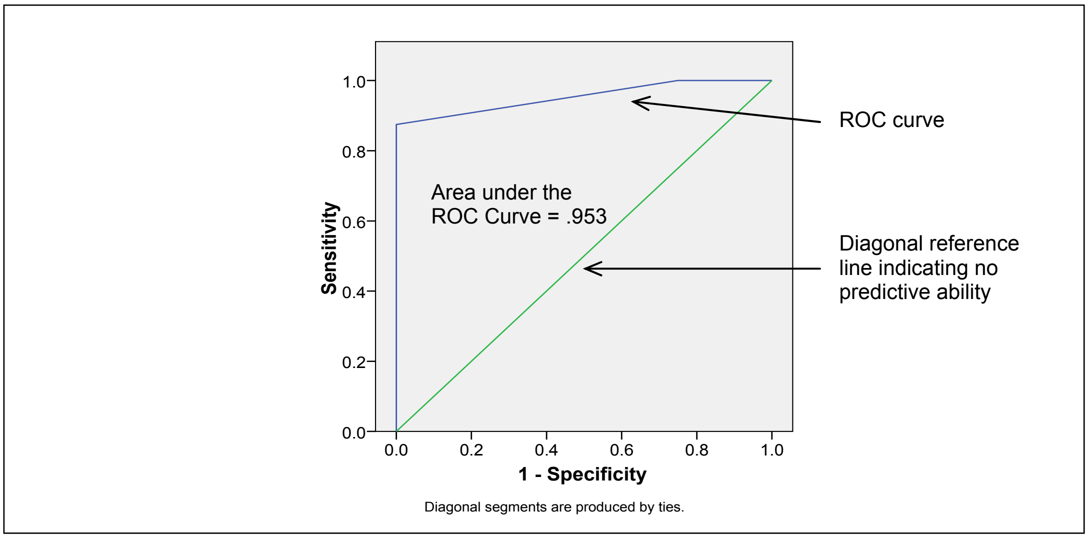


Figure 4.2. Example of a Receiver Operating Characteristic (ROC) curve

The AUC provides a measure of probability that the independent variable will allow correct identification of a positive or negative state of the outcome variable (Hanley & McNeil, 1982). Since it is constructed by ranked variables, the AUC is non-parametric; thus it is not significantly affected by the distribution of the underlying population (Hanley & McNeil, 1982). The measurement ranges from ±1.0 to 0.5 (a diagonal line) (Portney & Watkins, 2000). AUC values indicate: perfect (1.0), excellent (> .9), good (> .8), fair (> .7) and poor (> .6) accuracy (Perneczky et al., 2006). An AUC score of .5 (a diagonal line) indicated that a variable is no better at determining success than chance (Portney & Watkins, 2000).

In this study, a positive state referred to successful (*good*) outcomes and a negative state referred unsuccessful (*poor*) outcomes. Sensitivity described the rate of children who demonstrated successful outcomes (true positive), and specificity denoted the rate of children who experienced unsuccessful outcomes (true negative). Separate ROC Curves were constructed for each outcome variable. Children with and without vision impairment were analysed separately, as were outcomes at the end of the first year and end of the second year. The AUC confirmed the ability of the outcome Indices to differentiate between successful and unsuccessful performance. A significance value of $p < .05$ rejected the null hypothesis that the AUC was not different to an area of .5 (Portney & Watkins, 2000).

The influence of demographic factors on the predictive ability of the Indices was tested using sensitivity analysis. If no differences were found between analyses, only findings without demographic factors are reported. Where differences were found, both results are reported.

The number of factors that were required to predict successful outcomes was determined for each outcome. To do so, an Index cut-off that best differentiated between successful and unsuccessful performance was selected. This final analysis was only conducted for outcome Indices that demonstrated a statistically significant AUC measure. The ROC sensitivity and specificity curve coordinates determined the outcome Index cut-off score. The outcome Index cut-off score '*k*' reflected two things: (1) the proportion of children who would experience successful performance if they had greater than '*k*' number of factors at the start of the first year (sensitivity), and (2) the proportion of children who would experience unsuccessful performance if they had '*k*' or less factors at the start of the first year (specificity).

A curve coordinate with high sensitivity and specificity was selected where possible (Dawson & Trapp, 2001). This relates to a point closest to the upper left-hand corner of the curve. However, when such a clearly defined point did not exist, a curve coordinate with a higher specificity rather than a higher sensitivity was chosen (i.e. a point on the curve down and to the left) (Dawson & Trapp, 2001). This increased the rate of true-negatives, while also increasing false-positives. That is, the Collective Factor cut-off point *'k'* more accurately captured children truly at risk of *poor* performance, but also falsely captured some successful children and falsely predicting that they were at risk of *poor* performance. This was acceptable, since the clinical consequence of a false-positive is minimal. In practice, it would mean recommending that the number of factors at the start of the year were increased for a child who was actually going to be successful anyway. It is hypothesised that the intervention would not detrimentally affect the child, nor would it be particularly costly to the school. However, the consequence of a false-negative would be significant. If too few factors were recommended for implementation at the start of the year, children who were at risk of unsuccessful performance would receive insufficient interventions. This could have detrimental consequences for their inclusive outcomes and subsequent educational and social achievements. Finally, contingency tables illustrated trends in the Collective Factors and success.

4.10 OPERATIONALISATION OF THE QUIEM

The QuIEM was operationalised to apply to students with and without vision impairment in the contemporary Australian school context (Appendix T). Modifications sought to objectify observational scales. All changes were verified by two professional colleagues and pilot tested before use. Changes involved (1) definition of observation and interview terms, (2) terminology changes to apply to children with vision impairment or the current context, (3) standardisation of observation procedures, and (4) quantification of rating scale terms. Data collection changes were based on reliability and validity guidelines recommended for structured observation (Bryman, 2004; McCall, 1984).

1. Definition of terms

a. Adult-Child Contacts and Relationships scale. Terms were explicitly defined on the rating scale and observation sheet: *uninvolved*, *minimal, and appropriate*, *over* and *excessive* adult involvement (Appendix Table T1).

b. Program Goals and Purposes scale - Interview items rating guide. The phrase ‘inclusive services’ was defined to include interviewee reference to the terms ‘mainstreaming’, ‘integration’ and ‘involving child with disabilities’ with reference to physical, social and curricular components.

c. Actual Individualisation scale. The term ‘generalisation’ ‘activities’, ‘routines’, ‘transitions’, ‘strategy’, ‘procedure’ were further defined during the teacher interview (Appendix Table T2).

2. Terminology changes

a. Accessibility and Adequacy of the Physical Environment scale. The term ‘appropriate’ was substituted for ‘adapted’ throughout. All items were re-phrased, and content was added to apply to children with vision impairment rather than physical disability (Appendix Table T3). Key features of the physical environment were added based on the literature review (Arter et al., 1999; Best, 1992; Best & Corn, 1993; Chen, 1999b; Pagliano, 2002). Because significant content changes were made, this scale also underwent face validity testing. The rating of appropriateness of an environmental modification for individual children with vision impairment was made according to the 'educational implications of visual conditions matrix' (Mason, 1999).

b. Child-Child Contacts and Relationships scale. 'Interaction' was explicitly defined on the observation sheet as consisting of 'an initiation *and* response' a child has with another child, which may be verbal or non verbal (Appendix Table T4).

c. Actual Individualisation scale. The term 'objective' rather than 'goal' throughout the interview (Appendix Table T2).

3. Standardisation of observation procedures

In the original QuIEM, Participation and Engagement Scales were the only observation scales in which interval observation was specified. The remaining observation based scales (Adult-Child Contacts and Relationships Scale and Child-Child Contacts and Relationships Scale) relied on subjective rating of children's behaviour. As suggested by the authors of the tool, interval recording was applied to these scales. The procedures were based on the existing Participation and Engagement scale and current literature (Brown et al., 1999; Kemp & Carter, 2000; Shukla et al., 1999; Soukup et al., 2007).

The QuIEM Participation and Engagement Scale originally used five-minute observation intervals to concurrently observe a child with a disability and two peers. In this study two-minute intervals with 30-second data recording periods were used. Only one participant was observed during each interval. A timer was used to notify the interval and recording periods.

The researcher constructed recording forms (based on existing QuIEM Participation and Engagement Scale forms) for the Adult-Child Contacts and Relationships, Adequacy and Accessibility of the Physical Environment, and Child-Child Contacts and Relationships scales (Appendix Tables T.1, T.3, T.4). These reflected the operationalised terms and procedures.

The clusters of children in this study were observed during one day rather than the recommended two 2 hour observation periods (over two days). This occurred for several reasons: (1) the classes in the study were geographically wide-spread (i.e. rural and metro areas) throughout three states, thus it was not always feasible to combine observations across schools (e.g. spend half-days in two classes across two days); and (2) financial restrictions limited the amount of time the researcher spent interstate, thus two separate observation days could not be dedicated to each school. Rather than conducting some observations over one day, and others over two days it was decided to spend only one day at each school (per three participants). During the day, 10 interval observations were recorded on each of the five QuIEM observation scales for each participant.

The QuIEM manual recommended concurrent observation of different scales during the observation time. This process was standardised. QuIEM items and scales were completed successively for each child. Also, each child was observed in succession (i.e. all ‘interval 1’ observations were conducted for the first child, then all interval 1 observations for the next child. This was followed by all ‘interval 2’ observations etc.). This procedure captured variations in classroom activities, transitions and interactions that occurred during the day, and further standardised data collection.

4. Quantification of rating procedures

Finally, the rating procedures of the QuIEM observation-based scales (Accessibility and Adequacy of the Physical Environment, Adult-Child Contacts and Relationships, Individualisation, and Child-Child Contacts and Interactions scale) were quantified (Appendix Table T5). The original rating procedure was based on a description of behaviour, for example *mostly*, *occasionally*, *regularly* or *frequently*. In this study, all rating descriptions were quantified as percentages; either percentage of observation intervals, percentage of total number of behaviours observed or percentage of total time the that behaviour was demonstrated. For example, child *occasionally reciprocated interactions* was defined as child *reciprocated 33-66% of interactions* observed during the observation period.

4.11 FACE VALIDITY OF RESEARCHER-DESIGNED AND MODIFIED SCALES

It is essential, at least, to determine that measures reflect the content of the variables they seek to measure (Bryman, 2004). Face validity serves an important purpose; it determines whether the test is a plausible method of measuring a concept. Furthermore, instruments lacking in face validity may not be acceptable to participants (potentially resulting in non-compliance) (Portney & Watkins, 2000). As such, face validity testing was conducted on researcher constructed scales: (1) Teacher Demographic Questionnaire scales (1a) Teacher Training and Knowledge, (1b) Vision Specific Resources, and (2) Family Demographic Questionnaire item the Level of Early Intervention. Testing was also conducted on operationalised scales which held ambiguous relevance to the construct (3) QuIEM scales (3a) QuIEM Actual Individualisation, and (3b) QuIEM Adequacy and Accessibility of the Physical Environment.

Methods: A systematic procedure was used to avoid the subjective process often associated with face validity assessment (Portney & Watkins, 2000). A stakeholder panel rated the appropriateness and relevance of 21 items and 2 prefaces (for the scales listed above) on a five-point Likert scale; from *totally disagree* to *totally agree.* Ratings were then converted into dichotomous scores (*totally disagree, disagree* and *f*air counted as *disagree; agree* and *totally agree* counted as *agree)* and a percentage of agreement was calculated for each item. Items with greater than 80% agreement were deemed acceptable and remained unchanged (Apikomonhan, 2003). Items with less than 80% agreement were changed according to panel suggestions.

Results: A panel of eight stakeholders in the field of vision impairment and/or early intervention participated in face validity testing (*n* = 3 occupational therapists, *n* = 1 psychologist, *n* = 1 orthoptist, *n* = 3 early childhood teachers and academics). Four of the 23 items received less than adequate agreement (Table 4.4). Items 5 and 6 on the QuIEM Actual Individualisation Scale; and Items 1 and 4 of the QuIEM Accessibility and Adequacy of the Physical Environment. Changes were made to the four items as suggested by panel members.

Table 4.4. Face validity results of researcher designed or modified scales

Factor	Measurement tool, scale and item	% of agreement	Consensus of comments for items with less than 80% agreement
	Teacher Demographic Questionnaire		
Teacher training and experience	Teacher Training and Knowledge Scale		
	Item a: Number of Bachelor Degree units completed…	83	
	Item b. Number of Postgraduate Degree units completed…	100	
	Item c. Average number of hours per year attending…	100	
	Item d. Number of years previous experience teaching ….	100	
	Item e. Number of years previous experience teaching…	100	
Vision aides and equipment	Vision Aides and Equipment Scale		
	Preface: In the following questions, “vision resources” …	100	
	Item 1: Rate the presence of vision specific resources …	100	
	Item 2: Rate the timeliness regarding access …	100	
	Item 3: Rate the training that classroom staff …	100	
	Item 4: Rate the training that the child received…	100	

(table continues)

Table 4.4. ***(continued)***

Factor	Measurement tool, scale and item	% of agreement	Consensus of comments for items with less than 80% agreement
	Family Demographic Questionnaire		
Early intervention	Early Intervention		
	Indicate the type, frequency and number of months your …	100	
	Quality of Inclusive Experiences Measure		
Individualisation	Actual Individualisation		
	Item 1: Teacher's identification of activities, routines …	100	
	Item 2: Teacher's reported use of distributed instruction…	100	
	Item 3: Teacher's report of the extent to which all activities..	83	
	Item 4: Teacher's description of strategies, procedures …	100	
	Item 5: Teacher's report of the assignment of responsibility to teaching goals of child with disabilities	60	Use the term 'objective' rather than 'goal' throughout the questionnaire
	Item 6: Teacher's report of implementation of generalisation	67	Define 'generalisation' 'activities', 'routines', 'transitions', 'strategy', and 'procedure' for teachers.

(table continues)

Table 4.4. ***(continued)***

Factor	Measurement tool, scale and item	% of agreement	Consensus of comments for items with less than 80% agreement
	Quality of Inclusive Experiences Measure		
Physical environment	Adequacy and Accessibility of Physical Environment		
	Preface to scales: When answering the following questions..	100	
	Item 1: Adequacy of the classroom equipment and environment e.g. black/white board, desks & chairs…	71	Substitute 'appropriate' for 'adapted' throughout.
	Item 2: Adequacy of the materials in classroom …	86	
	Item 3: Child with vision impairments' participation in…	86	
	Item 4: Adequacy of personal care equipment (e.g.: colour/contrast/tactile marking/height of bathroom…	71	ECE Standards exist. Most children with vision impairment don't need adapted personal care. Delete this item.
	Item 5: Adequacy of the playground and outside play...	86	

4.12 PILOT TESTING OF THE QUIEM

The operationalised QuIEM underwent pilot testing prior to data collection. Pilot testing was conducted at one non-government-school kindergarten in Western Australia which had students with and without vision impairment. Informed principal and teacher consent was obtained, and the teacher distributed invitation letters to the parents of all students.

Six parents provided consent for their child to participate, and the teacher also participated in interviews and questionnaires. The researcher and a research assistant (a research therapist) spent two days at the kindergarten trialling the use of the operationalised QuIEM.

The research assistant was trained in the use of the QuIEM and the review of documentation (program mission statements), structured teacher interview, teacher questionnaire and observations were conducted. QuIEM ratings of the students were discussed with the teacher, who confirmed utility of the findings.

4.13 INTER-RATER RELIABILITY OF THE QUIEM

Methods: The researcher conducted and rated observations in the study. To determine accuracy of the researcher's QuIEM ratings, agreement and intra-class correlation with the research assistant at Time 1 was determined. Since some of the ratings were based on ordered-categorical data, both percentage of agreement and intra-class correlation were attained (Portney & Watkins, 2000). Raw agreement between observers is clinically meaningful and intra-class correlation reflects both degree of correspondence and agreement among ratings (Portney & Watkins, 2000).

Intra-class correlation assesses rating reliability by comparing the variability of different ratings of the same subject to the total variation across all ratings and all subjects (Portney & Watkins, 2000). It is the preferred method for small sample sizes (<15) (Garson, 2004) and testing reliability among dyads (Crano & Brewer, 2002). A two-way mixed effects model with an absolute agreement definition was used ($ICC_{3,2}$). In the mixed model, inferences are confined to the particular set of observers used in the measurement process; in this case, the researcher and the research assistant (Shrout & Fleiss, 1979). This model was appropriate, since the purpose was to establish reliability of the researcher's observations, not generalisation to other raters (McGraw & Wong, 1996; Portney & Watkins, 2000; Shrout & Fleiss, 1979). Single measurements of the raters were used because some of the measurements related to single items rather than scales of summed items (Portney & Watkins, 2000). Finally, because systematic differences among levels of ratings were considered relevant in this study, absolute agreement rather than consistency was used (McGraw & Wong, 1996).

Intra-class correlation scores range from zero to one. Conclusions were based on the following scores: (.0, .6) *virtually none* to *fair*; (.61, .8) *moderate*; and (.81, 1.0) *substantial* (Shrout, 1998). A percentage of agreement of 80% or more was considered appropriate (Dawson & Trapp, 2001).

Results: The researcher and the research assistant concurrently observed and rated nine children in three classroom situations on QuIEM observation based scales during Time 1 data collection. Agreement of 84.8% (196 of 231 items) was attained between the two raters. In addition, four scales attained *substantial* intra-class correlation scores and two demonstrated *moderate* levels (Table 4.5).

Table 4.5. Intra-class correlation of QuIEM researcher-rated scales

QuIEM Scale	Intra-class correlation [a]	95% *CI*	*F*- test *p*	Standard
Adequacy & Accessibility of the Physical Environment Scale [b]	.818	-.116, .995	.047	Substantial
Adult-Child Contacts & Relationships Scale				
Adult Involvement Item	.692	.163, .919	.009	Moderate
Individualisation				
Actual Individualisation Subscale [b]	1.000	.543, .970	.000	Substantial
Child-Child Contacts Scale	.643	.086, .904	.016	Moderate
Participation Scale	. 878	.576, .971	.000	Substantial
Engagement Scale	.846	.446, .963	.001	Substantial

Note. Unless otherwise noted, n = 9; QuIEM = Quality of Inclusive Experiences Measure.
Two-way mixed effects model where people effects are random and measures effects are fixed.
[a] Single measures Type A intra-class correlation coefficients using an absolute agreement definition. The estimator is the same, whether the interaction effect is present or not.
[b] Classroom n = 3.

4.14 CONCLUSION

This chapter has described the design of Phase 2. It has described participant recruitment procedures, provided information about the tools, data collection procedures, and analysis of the three research aims. The results of each of the three Phase 2 aims are presented in chapter 5. The results report on the educational situation that children with vision impairment are exposed to, the inclusive outcomes that they achieve, and the predictors of successful outcomes. The major findings are then discussed in chapter 6.

CHAPTER 5

RESULTS

5.1 INTRODUCTION

This chapter presents the Phase 2 results. It reports on three aims: (1) the situation that children with vision impairment are exposed to in regular early education is described, (2) the inclusive outcomes of children with and without vision impairment are compared, and (3) the influence of stakeholder identified factors on inclusive outcomes is determined. This chapter begins with a description of the participants at each point in time, as well as an overview of missing data. The results of each aim are then reported in separate sections. Within each section, the four inclusive outcomes are reported in turn: participation, engagement, child interaction and then academic performance.

5.2 PARTICIPANTS AT TIME 1

In total 166 invitations were distributed to parents of children with vision impairment in Western Australia (n = 57), Victoria (n = 100), New South Wales (n = 9) and Queensland (n = not known due to recruitment procedures). Thirty-one children were recruited (n = 10 Western Australia, n = 16 Victoria, n = 2 New South Wales, n = 3 Queensland), with an approximate response rate of 18.7%. Eleven participants were not included due to ineligibility, education staff choosing not to participate, or loss to follow-up (Table 5.1). Twenty children with vision impairment were included in the final sample.

The response rate for classmates is unknown. Participating teachers forwarded invitations to all eligible classmates, in the attempt to recruit two classmates per class. In some classes few classmates met the selection criteria or parents were reluctant, whereas in others, classmate parental response exceeded expectations. Thus, two matched classmates were recruited for half the children with vision impairment, and the remaining participant clusters contained between zero to five matched classmates (Table 5.2).

Table 5.1. Non-inclusion by state and reason

Reason for non-inclusion	No. children not included				
	Western Australia	Victoria	New South Wales	Queensland	Total
Ineligible		2			2
Principal or teacher declined	2	1	1	2	6
Lost to follow-up		2	1		3

Table 5.2. Frequency and number of classmates in clusters

No. children with vision impairment (%)	No. classmates in cluster [a]
3 (15)	0
4 (20)	1
10 (50)	2
	3
2 (10)	4
1 (5)	5
20 (100)	

[a] Cluster refers to participant with vision impairment and their respective, matched classmates.

Fifty-seven children participated at Time 1: twenty children with vision impairment and 37 classmates (Table 5.3). The children attended 20 different classes based at 19 regular education settings (two clusters attended the same school) in Western Australia, Victoria and Queensland. No children from New South Wales were included in the sample. Most clusters attended government schools (57.8%, n = 12), while the rest attended Catholic schools (n = 4), independent schools (n = 2) or private kindergarten programs not attached to a school (n = 2). Most participants (57.9%) were enrolled in pre-primary, and the remainder attended kindergarten or grade 1 classes. Four of the classes were split grade level (i.e. several grades in the one class). The class sizes ranged from 14 to 27 students (M = 21.6, SD = 3.0).

The children ranged in age from three years, four months to six years, eight months (M = 64.7 months, SD = 8.4 months), with an equal number of males and females. The groups of children with and without vision impairment did not significantly differ in terms of age; gender; school grade; state; previous school experience; or program attendance (p > .05) (Table 5.4). All classmates were sighted, as reported by teachers and parents.

Table 5.3. Number of participating children at Time 1 by vision status, grade and State

Grade	*n* children with vision impairment (*n* classmates)			
	Western Australia	Victoria	Queensland	Total
Kindergarten	1 (2)	3 (3)	0 (0)	4 (5)
Pre-primary	2 (6)	8 (17)	0 (0)	10 (23)
Grade 1	5 (9)	0 (0)	1 (0)	6 (9)
Total	8 (17)	11 (20)	1 (0)	20 (37)

Table 5.4. Demographics of children with and without vision impairment at Time 1

Variable	Vision impairment	Classmates	Statistic [a]
	M (*SD*) or *n* (%)		
Child age (month)	64.8 (9.2)	64.72 (7.8)	.817
Previous school experience (term)	1.6 (2.4) [b]	1.0 (1.9) [c]	.733
Baseline parent age (years)	37.4 (4.9) [b]	37.4 (5.5) [d]	.406
Child gender			
Male	10 (50.0%)	18 (48.6%)	1.000
Female	10 (50.0%)	19 (51.4%)	
Co-existing disability			
Not present	13 (65.0%)	35 (94.6%)	.006 **
Present	7 (35.0%)	2 (5.4%)	
Grade			
Kindergarten	4 (20.0%)	5 (13.5%)	.460
Pre-primary	10 (50.0%)	23 (62.2%)	
Grade 1	6 (30.0%)	9 (24.3%)	
State			
WA	8 (40.0%)	17 (45.9%)	.376
Not WA	11 (60.0%)	20 (54.1%)	
Program attendance			
Full-time	16 (84.2%)	28 (84.8%)	1.000
Part-time	3 (15.8%)	5 (15.2%)	
Parent gender			
Male	0 (0.0%)	2 (6.6%)	.523
Female	19 (100.0%)	30 (93.4%)	
Parent marital status			
Married / defacto	15 (75.0%)	26 (78.8%)	.748
Other	5 (25.0%)	7 (21.9%)	
Family income pre-tax			
< \$60, 000 / year	11 (64.7%)	15 (51.7%)	.528
>\$60, 000 / year	6 (35.3%)	14 (48.3%)	
Primary family language			
English	18 (90.0%)	31 (96.9%)	.551
Other	2 (10.0%)	1 (3.1%)	
Parent education			
Non-tertiary	12 (63.2%)	18 (54.5%)	.576
Tertiary	7 (36.8%)	15 (45.5%)	

Note. Unless otherwise noted: children with vision impairment n = 20 and classmates n = 37; WA = Western Australia.
[a], Kilmorov-Smirnov z scores reported for continuous data and Fisher's Exact 2-sided p value reported for categorical.
[b] $n = 19$. [c] $n = 32$. [d] $n = 29$.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Most children (80%, n = 17) were classified as having low vision according to the WHO definition (best corrected visual acuity in the best eye between 6/18 to 3/60 and less than 20 degree visual field, (WHO, 2006) and one child was totally blind as reported by parents (Table 5.5). Two parents were unable to report their child's visual acuity or visual field (due to difficulties in accurate assessment of vision amongst young children, particularly with fluctuating vision as caused by cortical visual impairment). Furthermore, twenty percent (n = 4) of participants had severe vision impairment and the remainder (n = 14) had moderate impairment (Table 5.6).

The average age of onset of vision impairment was 7.4 months (SD = 10.4) and mean age of diagnosis was 14 months (SD = 18). Most children (75%, n = 15) had only one primary vision condition; including achromatopsia (n = 1), albinism (n = 1), amblyopia (n = 1), aniridia (n = 1), anophthalmia (n = 1), Best's eye disease (n = 1), bilateral coloboma (n = 1), cataracts (n = 3), cone or rod dystrophy (n = 2), congenital myasthenia gravis (n = 1), and Leber's congenital amaurosis (n = 2). One parent did not report their child's vision condition. Four children had multiple vision conditions; including bilateral coloboma, nystagmus and cone dystrophy (n = 1); cortical visual impairment and cataracts (n = 1); homonymous hemianopia, cortical visual impairment and esotropia (n = 1); and Leber's congenital amaurosis, high myopia and night blindness (n = 1).

Seven (35%) children with vision impairment had at least one co-existing disability as reported by their parent and/or teacher; including hearing impairment, hormone deficiency, kidney dysfunction, low tone, developmental delay, acquired vascular injury, cerebral palsy, speech impairment, and congenital myasthenia gravis. Severity of disability was not related to severity of vision impairment (Fisher's Exact p > .05).

Two classmates had mild disabilities reported by parents: a *barely noticeable* hearing impairment (n = 1) and transient juvenile arthritis that was *noticeable only after spending a long time* (n = 1). Their performance did not significantly differ to classmates without disabilities in any outcome at any of the three time periods (Appendix U), and teachers agreed. It is acknowledged that the small sample (n = 2 and 35) may limit this analysis, however, on the basis of teacher assessment and outcomes, the two classmates with disabilities were retained in the classmate sample.

Table 5.5. Visual acuity and visual field of children with vision impairment

Vision measurement	*n* (%)
Best corrected visual acuity	
< 6/18 to 6/60	14 (70)
< 6/60 to 3/60	1 (5)
< 3/60 with light perception	0 (0)
No light perception	1 (5)
Don't know / unable to assess	4 (20)
Visual field	
No visual field restrictions	4 (20)
< 20 to 10 degree visual field	2 (10)
< 10 degree visual field	2 (10)
Don't know / unable to assess	12 (30)
Total	20 (100)

Table 5.6. Severity status of secondary disabilities amongst children with vision impairment as reported by parents

Severity of co-existing disability	Children with vision impairment *n* (%)			Classmate *n* (%)
	Severity of impairment			
	Moderate	Severe	Unknown	
No co-exiting disability	8 (57.1)	4 (100)	1 (50)	35 (94.6)
Barely noticeable	2 (14.3)			1 (2.7)
Noticeable after spending a long time with the child				1 (2.7)
Noticeable after spending a short time with the child	2 (14.3)			
Can be noticed by most	2 (14.3)		1 (50)	
Total	14 (100)	4 (100)	2 (100)	37 (100)

Note. Moderate visual impairment = Visual acuity < 6/18-6/60 and/or visual field < 20-10 degrees;
Severe visual impairment = Visual acuity < 6/60 and/or visual field < 10 degrees.

Nineteen mothers of children with vision impairment (one parent did not return the questionnaire) and 32 parents of classmates (*n* = 2 fathers, *n* = 5 missing questionnaires) participated. There were no differences amongst families of children with and without vision impairment regarding parental marital status, age, education level, income or primary language spoken at home ($p > .05$). Only two families were of non-English speaking background; these were families of children with vision impairment. In addition, twenty female teachers participated in the study. They had a mean age of 40.2 years ($SD = 14.5$) and had been teaching for between one term to 30 years ($M = 11.7$ years, $SD = 8.6$). Ten male and 10 female principals/administrators participated, with a mean age of 47.6 years ($SD = 5.2$).

5.3 PARTICIPANTS AT TIME 2

Three classmates from Victoria (*n* = 1 kindergarten, *n* = 2 pre-primary) were lost to follow-up at Time 2 due to a change of contact details. As such, the Time 2 sample was comprised of 20 children with vision impairment and 34 classmates. The classmate demographic characteristics did not change significantly despite the loss of three participants ($p > .05$ for all demographic variables measured). While the marital status of the parents were similar at Time 1, a significantly higher proportion of parents of children with vision impairment were not living with a partner at Time 2 (25% vs. 13.3%, $p < .01$). This was the only change between the groups. Finally, two teachers (who taught two children with vision impairment and two classmates) changed during the course of the year, however there was no significant statistical difference in gender, age or years teaching experience amongst teachers at Time 1 and Time 2 ($p > .05$).

5.4 PARTICIPANTS AT TIME 3

A portion of the sample participated at Time 3. As outlined in the selection criteria, children who were in grade 1 at the beginning of the study were excluded at Time 3 due to age restrictions (i.e. they had advanced to grade 2). Thus, seven children with vision impairment and 13 classmates were not included at Time 3 due to age, withdrawal or loss to follow-up (Table 5.7).

The Time 3 sample was comprised of 13 children with vision impairment and 21 classmates who attended pre-primary and grade 1 in Western Australia and Victoria (Table 5.8). All children advanced a grade level, therefore changed class and teacher. While the majority of children (n = 27) remained at the same school as the previous year, seven children (n = 4 with vision impairment and n = 3 classmates) attended a different school. In addition, many of the students were allocated to different classes. As such, the majority of clusters were separated at Time 3. While eight children with vision impairment no longer shared a class and/or school with their original classmates (n = 14 classmates), five children with vision impairment continued to share a class with at least one of their original classmates (n = 7 classmates). The sighted participants continued to be referred to as *classmates* throughout this thesis. In total, the children attended 24 different classes at 16 schools. The classes children with and without vision impairment attended were not significantly different in terms of state of location, grade level or number of students enrolled (p > .05).

At Time 3 the children had an average age of six years, 11 months (SD = 6 months). The age, gender and previous school experience and parent socio-demographic characteristics were not significantly different between children with and without vision impairment (p > .05). Furthermore, the disability characteristics (severity of vision impairment, age of onset, age of diagnosis and severity of co-existing disability) of children with vision impairment participating at Time 3 did not differ significantly from those participating at Time 1 (p > .05).

Twenty four teachers (including n = 1 male) with a mean teaching experience of 16.7 years (SD = 11.8) participated at Time 3. One teacher had also participated in the study the previous year. Thirteen teachers taught students with vision impairment and 11 teachers did not teach students with vision impairment (i.e. they taught ‘only classmates’). Of these 11 teachers, two currently taught students with other disabilities. The age and teaching experience of teachers of children with and without vision was not significantly different (p > .05). Finally, 16 principals were involved at Time 3, including eight from the previous year.

Table 5.7. Non-inclusion of participants at Time 3

Reason for non-inclusion	No. children with vision impairment	No. classmates	Total
Selection criteria (child in grade 2)	6	9	15
Parent withdrew	0	3	3
Lost to follow-up	1	1	2
Total	7	13	20

Table 5.8. Time 3 participants by vision status, education level and state

Grade	*n* children with vision impairment (*n* classmates)		
	Western Australia	Victoria	Total
Pre-primary	1 (2)	3 (2)	4 (4)
Grade 1	2 (5)	7 (12)	9 (17)

5.5 MISSING QUESTIONNAIRES

The average questionnaire return rate from teachers, parents and principals was 89.3%; ranging from 85 to 100% at Time 1, 70.6 to 100% at Time 2 and 76.2 to 100% at Time 3. In addition, despite altering observation days to accommodate students, one classmate and one child with vision impairment were absent for the Time 1 and Time 3 observation dates respectively. Since there was no trend to the participants or trends with missing data, the data were treated as missing rather than substituting a value or deleting the variable (Dawson & Trapp, 2001). Because of this the sample size of variables analysed varies and is reported for each analysis.

5.6 THE SITUATION OF CHILDREN WITH VISION IMPAIRMENT IN REGULAR EARLY EDUCATION

The following section reports the results of Aim 1. It focuses on the stakeholder factors that were identified in the first phase, with an aim of describing the situation that children with vision impairment are exposed to in regular early education.

Four objectives are addressed in this section. (1) The adequacy of the stakeholder factors are described using categorical data. *Adequacy* was determined by the cut-off scores that defined *good* and *poor* conditions (Table 4.3). (2) Relevant stakeholder factors are compared between children with and without vision impairment, to determine whether children with vision impairment experience equality in their treatment and environment. Since some of the stakeholder factors related to classes or teachers rather than children, children with and without vision impairment were exposed to the same factors (they shared the same classes). As such, classmate levels at Time 1 and 2 are not reported (see section 4.9.1). However, at Time 3, many classmates were in different classes. As such, 'classmate only' class scores at Time 3 are reported for relevant factors. Finally, this section reports changes in stakeholder factors over time: (3) during the first year, and (4) during the second year.

The results are illustrated by figures. This enables presentation of comparison between-groups with and without vision impairment and change between time periods. In order to demonstrate the *adequacy* of the factors, the *good* level cut-off scores for the relevant measurement tool are also depicted on the figure. Since the SSRS had different cut-off scores for boys and girls, both values have been shown.

The Activity Performance factor is reported first, followed by the Personal factor and Environmental factors.

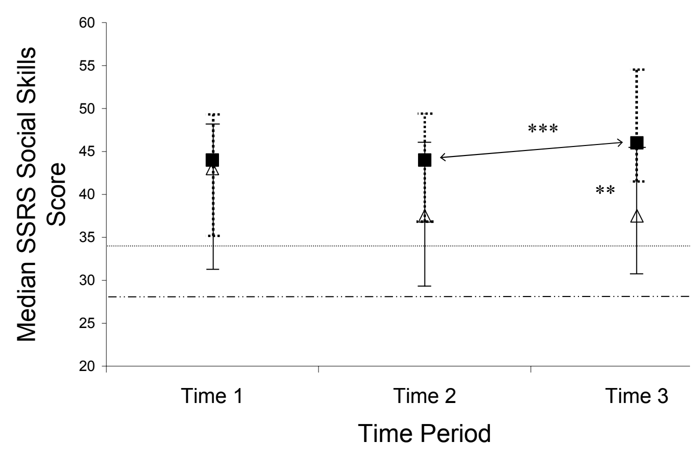
5.6.1 Activity Performance Factor (Social Skills)

Descriptive analysis found that the majority of children with and without vision impairment demonstrated adequate (*good* level) SSRS social skills at each point in time (78.9% vs. 94.3% Time 1, 75% vs. 85.3% Time 2, 91.7% vs. 95.2% Time 3).

There were no differences between the social skills of children with vision impairment and classmates in the first year of the study. Scores on the SSRS Social Skills Total did not differ significantly between the groups at Time 1 or Time 2 (p > .05) (Figure 5.1). However, the social competence of children with and without vision impairment increasingly widened over time. At Time 3 children with vision impairment had significantly poorer SSRS social skills than classmates (p < .01). While the social skills scores of children improved significantly during the second year (p < .001), the social skills of children with vision impairment did not change.

5.6.2 Personal Factor (Early Intervention)

The majority (57.9%, n = 12) of children with vision impairment had received early intervention prior to the age of three years. They had received an average of 14.4 months (SD = 15.3) of early intervention from birth to three years of age. Expectedly, none of the classmates had received early intervention.



	n by time period			*z*	
	1	2	3	Time 1-Time 2	Time 2 - Time 3
VI	19	20	12	-1.204	-.0708
CL	35	34	21	-.946	-3.185
U	283.5	251.5	56.0		

Figure 5.1. Social skill median and interquartile range by vision impairment group and time period

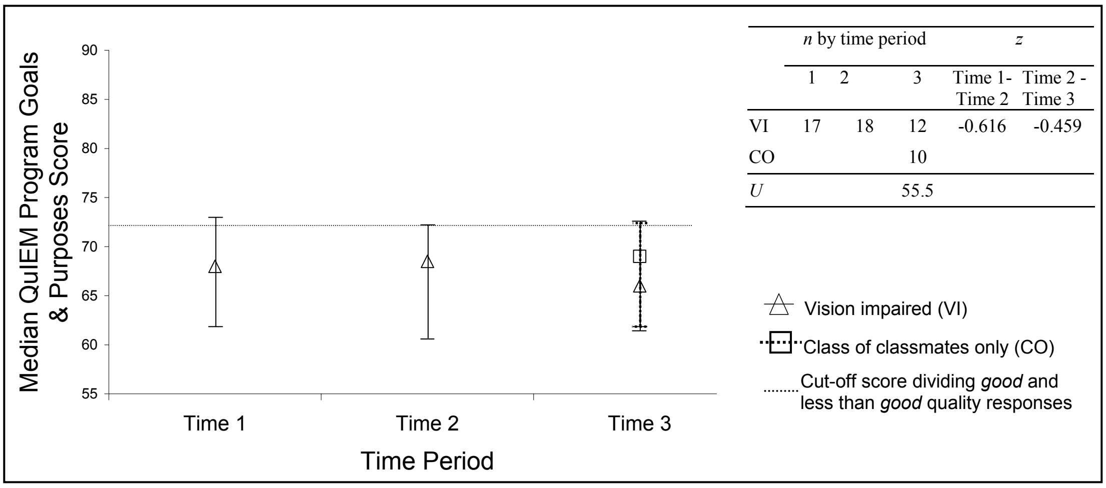
Note. SSRS = Social Skills Rating System; U = Mann-Whitney U score; z = Wilcoxon z score.
* p < .05. ** p < .01. *** p < .001.

5.6.3 Environmental Factors

School attitude: School attitude toward inclusion was measured by the QuIEM Program Goals and Purposes scale. This captured the philosophy of the school, the importance of inclusion to the program, and principal and teacher commitment to inclusion. Throughout the study, most schools and programs that children with vision impairment attended reported a *poor* (negative) attitude towards inclusion (Time 1 58.8%, n = 10; Time 2 66.7%, n = 12; Time 3 75% n = 9). While the categorical data indicated that schools of students with vision impairment demonstrated increasingly negative attitudes over the two years, these trends were not significant based on the QuIEM Program Goals and Purposes scores ($p > .05$) (Figure 5.2). There were no significant differences between schools that children with vision impairment and classmates only attended at Time 3, with 70% of 'classmate only' schools reporting a *poor* attitude; there were no significant differences in the scores.

Teacher attitude: Teacher attitude was measured as a separate construct to school attitude using the Teacher Opinion Questionnaire. This gauged teacher's general attitude towards including a child with a disability in the mainstream class, their perspective on the social merits of inclusion and perceptions of their ability to adequately include and manage the child's behaviours and needs. The majority of teachers of students with vision impairment had a positive attitude towards inclusion (Time 1 77.8%, n = 14; Time 2 70%, n = 14; Time 3 91.7%, n = 11).

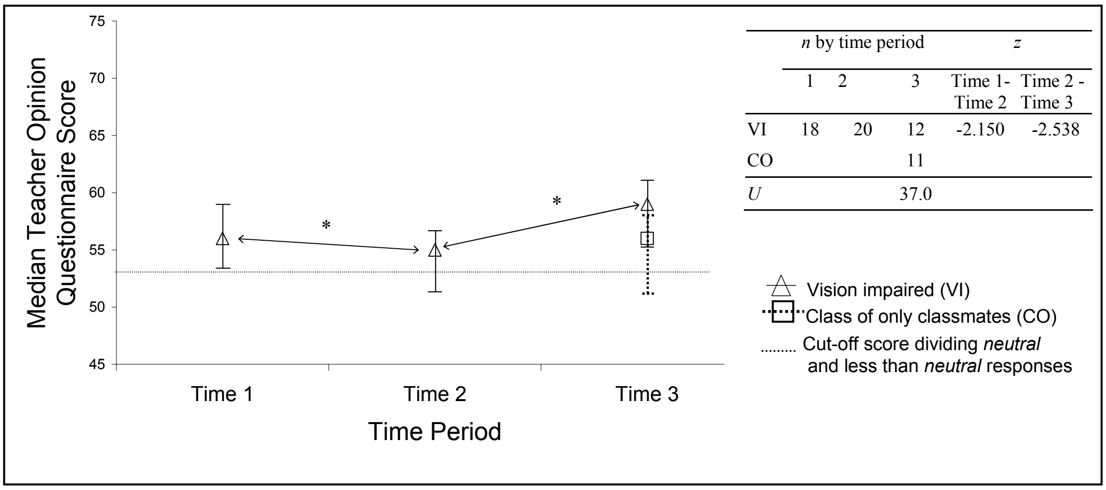
The whole sample Teacher Opinion Questionnaire score significantly decreased during Time 1 to Time 2 (Figure 5.3). The whole sample included four teachers who changed during the year (two teachers left after Time 1 and were replaced at Time 2). When considering only teachers who taught during the entire first year, their attitude did not change significantly during that time (n = 16, Mdn = 56, IQR = 6.5 vs. n = 18, Mdn = 55, IQR = 4.75, z = -1.762, p = .078). The change caused by such a small number of participants (n = 4) must be interpreted with caution. The Time 3 teachers of children with vision impairment had a more positive attitude than Time 2 teachers ($p < .05$). At Time 3, there was no significant difference between the attitude of teachers with students with vision impairment versus classmates only ($p > .05$), however only 54.5% of the latter had a *positive* attitude towards inclusion.



	n by time period			*z*	
	1	2	3	Time 1- Time 2	Time 2 - Time 3
VI	17	18	12	-0.616	-0.459
CO			10		
U			55.5		

Figure 5.2. School attitude median and interquartile range of classes with students with vision impairment and 'classmates only' by time period

Note. QuIEM = Quality of Inclusive Experiences Measure; *U* = Mann-Whitney *U* score; *z* = Wilcoxon *z* score.
* $p < .05$. ** $p < .01$. *** $p < .001$.



	n by time period			*z*	
	1	2	3	Time 1- Time 2	Time 2 - Time 3
VI	18	20	12	-2.150	-2.538
CO			11		
U			37.0		

Figure 5.3. Teacher attitude median and interquartile range of teachers with students with vision impairment and classmates only by time period

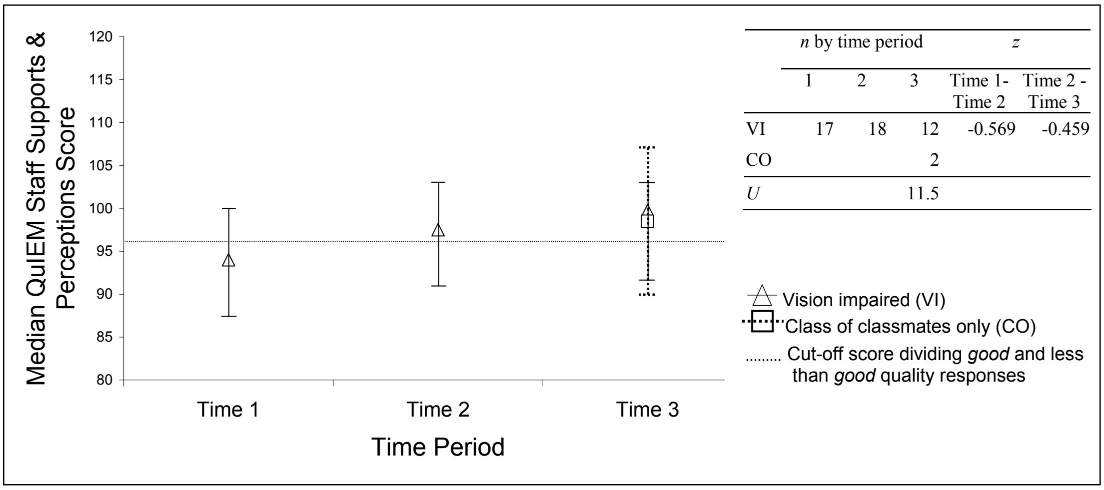
Note. *U* = Mann-Whitney *U* score; *z* = Wilcoxon *z* score.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Staff support: Teacher and principal perception of the level of support provided to teachers (reported on the QuIEM Staff Supports and Perception Scale) was low among most classes throughout the study. Less than one-third of the classes with students with vision impairment had a *good* level of staff support at each data collection period (Time 1 47.1%, $n = 8$; Time 2 55.6%, $n = 10$; and Time 3 66.7%, $n = 8$). Perception of staff support did not change significantly throughout the two years ($p > .05$) (Figure 5.4).

Two principles and teachers from *classmate only* classes rated the staff support provided for the inclusion of students with disabilities other than vision impairment (since this questionnaire applied only to teachers of students with disabilities) at Time 3. The staff support scores did not differ significantly between the teachers of *classmates only* and teachers of students with vision impairment.

Individualisation: Individualisation of the curriculum (planning, delivery and goals) to meet the objectives of the children with vision impairment was reported by teachers on the QuIEM Actual Individualisation items. The level of reported individualisation was high, with all teachers reporting a *good* level (i.e. a *good* or *excellent* quality); at both Time 1 and Time 2 35% of programs were of *good* quality ($n = 13$) and 65% were of *excellent* quality ($n = 7$).

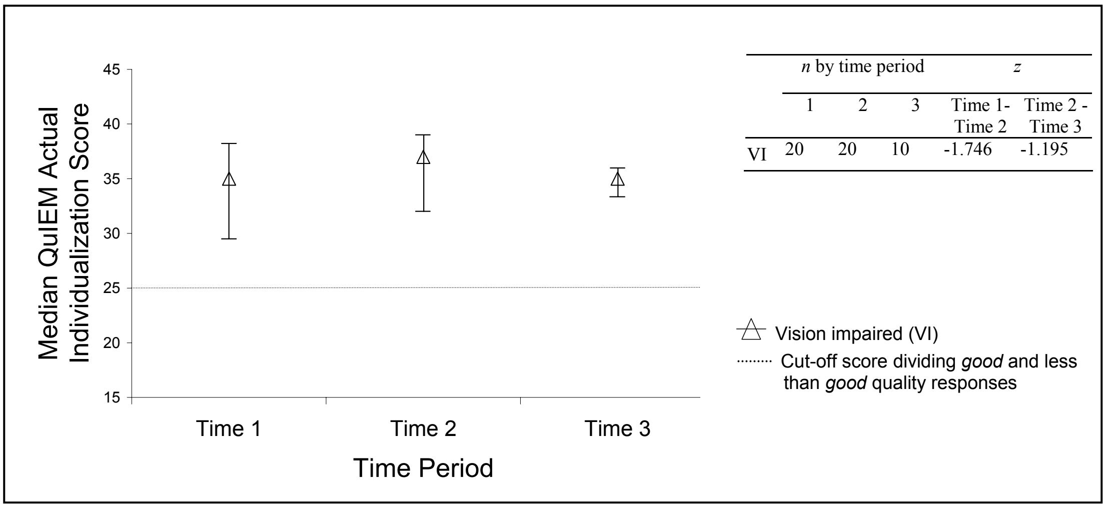
The Individualisation scores did not significantly change over the first year or the second year ($p > .05$) (Figure 5.5). At Time 3, 40% of programs reported *good* quality and 60% reported *excellent* quality of individualisation of the curriculum.



	n by time period			*z*	
	1	2	3	Time 1-Time 2	Time 2 - Time 3
VI	17	18	12	-0.569	-0.459
CO			2		
U			11.5		

Figure 5.4. Staff support median and interquartile range of teachers of students with vision impairment and 'classmates only' by time period

Note. QuIEM = Quality of Inclusive Experiences Measure; *U* = Mann-Whitney *U* score; *z* = Wilcoxon *z* score.
* $p < .05$. ** $p < .01$. *** $p < .001$.



	n by time period			*z*	
	1	2	3	Time 1-Time 2	Time 2 - Time 3
VI	20	20	10	-1.746	-1.195

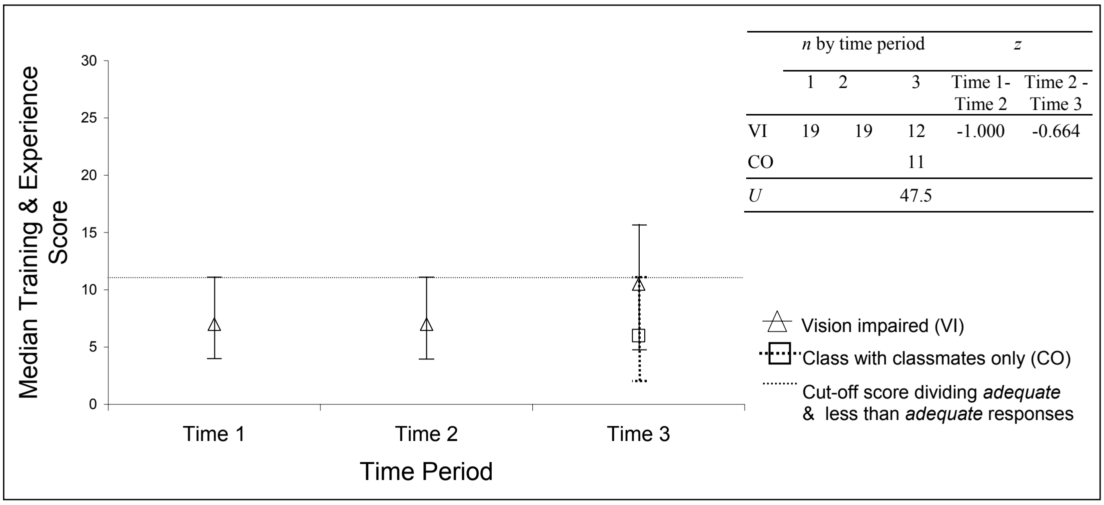
Figure 5.5. Individualisation median and interquartile range for children with vision impairment by time period

Note. QuIEM = Quality of Inclusive Experiences Measure; *U* = Mann-Whitney *U* score; z = Wilcoxon *z* score.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Teacher training and experience: The training (in inclusive education practices and vision impairment) and experience of teachers (with students with vision impairment and disabilities) who taught in the first and second years was limited. Most of the nineteen teachers who completed questionnaires in the first year had a *poor* or limited overall level of training and experience (Time 1 68.4%, n = 13; Time 2 73.7%, n = 14). At Time 1, the majority of teachers (89.5%, n = 17) had training about inclusive education or vision impairment at annual professional development sessions (mostly half days rather than full or multiple days); half at Bachelor level (52.6%, n = 10); and few (10.5%, n = 2) at Postgraduate level. Furthermore, while the majority of teachers (84.2%, n = 16) had previously taught a child with a disability, few (26.6%, n = 4) had previous experience with a student with vision impairment.

While the majority (66.7%, n = 6) of Time 3 teachers of students with vision impairment had a *good* level of experience and training, their score was not statistically significantly different to the teachers who had participated in the first year (Figure 5.6). In addition, while only one third of Time 3 teachers of 'classmates only' had *good* training levels, this did not differ significantly to teachers of students with vision impairment.

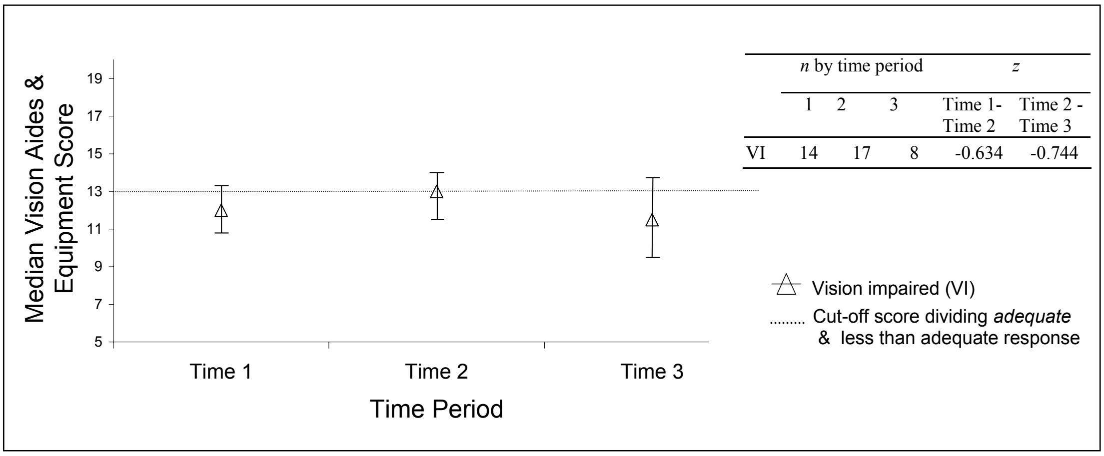
Vision aides and equipment: The availability, timeliness and training (for children and teachers) in use of recommended vision aides and equipment (e.g. optical and non-optical aides, modified print, technology) was low. At Time 1 only one fifth of classes (28.6%) had a *good* level of equipment, that is, the aides were always available at the time required and sufficient training had been provided. At the end of the study, still only 37.5% of classes had adequate levels of vision aides and equipment. The median Vision Aides and Equipment score did not change significantly over time or between different classes over the two years (p > .05) (Figure 5.7).



	n by time period			*z*	
	1	2	3	Time 1- Time 2	Time 2 - Time 3
VI	19	19	12	-1.000	-0.664
CO			11		
U			47.5		

Figure 5.6. Teacher training and experience median and interquartile range of teachers of students with vision impairment and 'classmates only' by time period

Note. U = Mann-Whitney U score; z = Wilcoxon z score.
* $p < .05$. ** $p < .01$. *** $p < .001$.



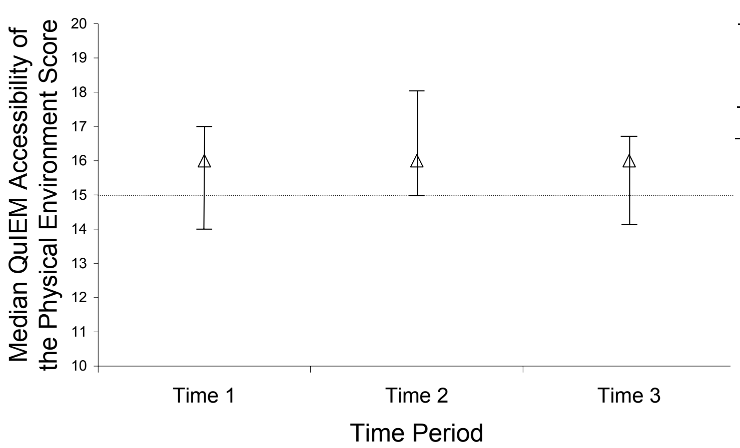
	n by time period			*z*	
	1	2	3	Time 1- Time 2	Time 2 - Time 3
VI	14	17	8	-0.634	-0.744

Figure 5.7. Vision aides and equipment median and interquartile range of children with vision impairment by time period

Note. z = Wilcoxon z score.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Physical environment: The majority of classes had an adequate and accessible physical environment for children with vision impairment, as rated by the QuIEM Accessibility and Adequacy of the Physical Environment Scale. The proportion of programs with a *good* physical environment level ranged from 65.0% (n = 13) at Time 1 to 95.0% (n = 19) at Time 2, and 100% (n = 12) at Time 3.

As the categorical analysis demonstrated, the adequacy of the physical environment of the programs improved over the course of the first year. Significantly more programs improved the physical environment during the year (30%, n = 6) and no environment deteriorated in quality (McNemar Exact p = .031, n = 20). While the score did not change for the whole sample (Figure 5.8), significant improvements were found among the 16 classes who retained the same teacher throughout the year. For these classes, the QuIEM Physical Environment Accessibility and Adequacy score significantly increased (*Mdn* = 16.0, *IQR* = 3.25 vs. *Mdn* = 16.5, *IQR* = 3.0, Wilcoxon z = -2.144, p = .03, n = 18). Teachers who taught in the same class throughout the year made significant improvements to the physical environment. It must be noted, with caution that *two* classes affected the significance of the results. Such a small sample size may not reflect typical trends in the population of classes with students who are vision impaired. Finally, the appropriateness of the physical school environment that children with vision impairment attended at Time 3 was not statistically different to the previous year (p > .05).



	n by time period			*z*	
	1	2	3	Time 1- Time 2	Time 2 - Time 3
VI	20	20	12	-1.414	-1.628

Figure 5.8. Physical environment median and interquartile range for *all* classes of children with vision impairment by time period

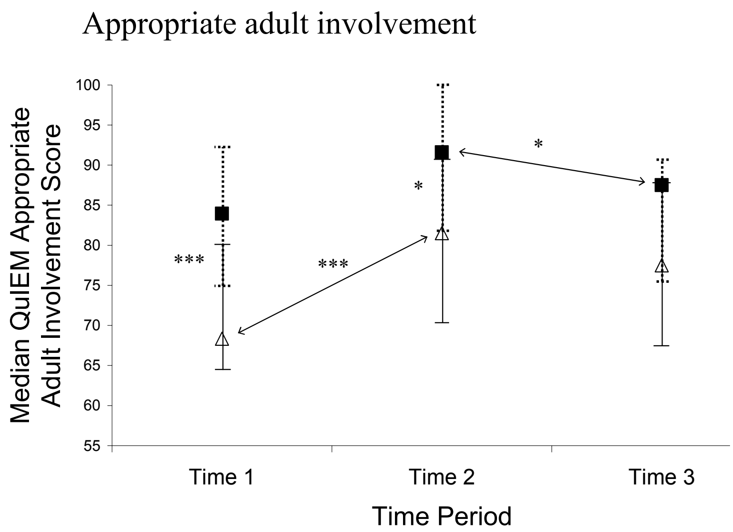
Note. QuIEM = Quality of Inclusive Experiences Measure; U = Mann-Whitney U score; z = Wilcoxon z score.
* p < .05. ** p < .01. *** p < .001.

Adult involvement: Adult involvement was assessed by observing the extent to which adults in the class were involved with children (*minimal, appropriate, or over-involved*) for the majority of time. The adults observed were classroom teachers, itinerant teachers, education assistants, parents and volunteers. There were significant differences in the way that adults treated children with and without vision impairment (Figure 5.9).

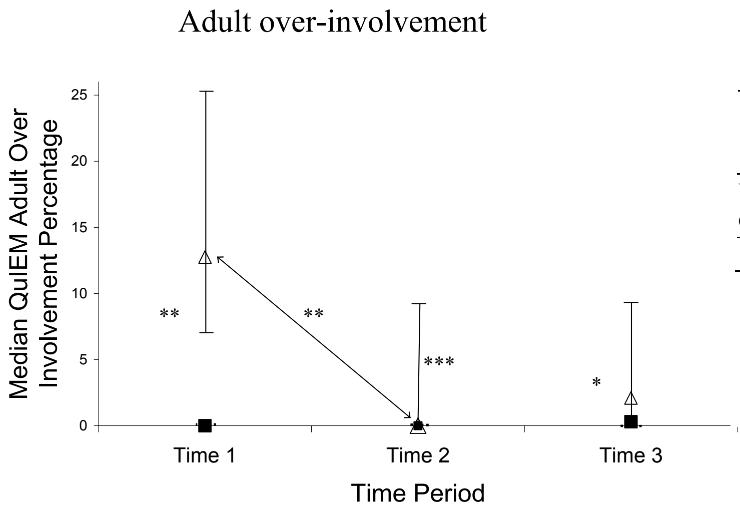
Specifically, adults in the class were consistently more *over-involved* with children with vision impairment than their sighted peers. The adult over-involvement scores were significantly higher for children with vision impairment than classmates at Time 1 ($p < .001$), Time 2 ($p < .01$) and Time 3 ($p < .05$). Adults frequently provided a level of assistance (prompts, cues, level of activity) or time with the child that impeded the child's ability to be actively or independently involved. There was no statistical difference between the amounts of *minimal involvement* afforded to each group.

During the first year, the adult involvement with children with vision impairment significantly improved; that is, it moved to being more appropriate. The adult over-involvement score decreased significantly ($p = .001$). This improvement was maintained, as children with vision impairment experienced no change in adult over-involvement from Time 2 to Time 3 ($p > .05$). These trends are also illustrated in the categorical data. Fewer children with vision impairment were afforded appropriate levels of adult involvement at Time 1 (35%, $n = 7$ vs. 83.3%, $n = 30$, $p < .001$), however there were no significant differences between-groups at Time 2 (80%, $n = 16$ vs. 85.3%, $n = 29$, $p > .05$) or Time 3 (75%, $n = 9$ vs. 76.2%, $n = 17$, $p > .05$).

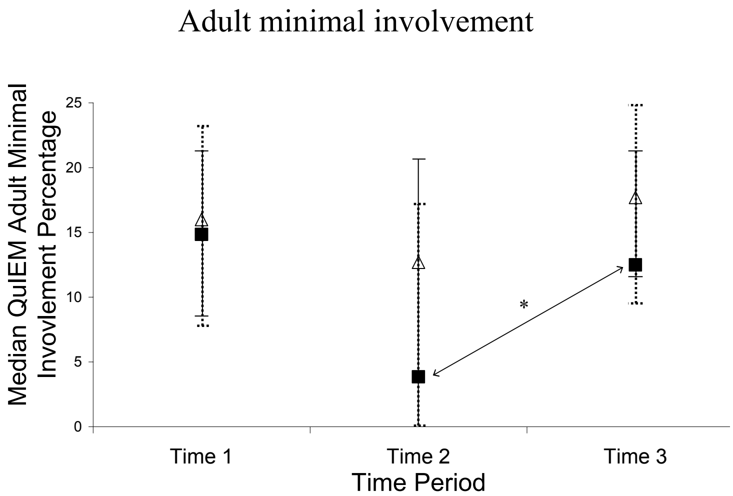
One the other hand, classmates, experienced an increase in *minimal* adult involvement during the second year ($p < .05$). Teachers during the second year provided the classmates with *minimal* attention more often than teachers had done in the first year.



	n by time period			*z*	
	1	2	3	Time 1- Time 2	Time 2 - Time 3
VI	20	20	12	-3.291	-1.784
CL	36	34	21	-1.868	-2.314
U	135.0	206.0	92.0		



	n by time period			*z*	
	1	2	3	Time 1- Time 2	Time 2 - Time 3
VI	20	20	12	-3.337	-1.572
CL	36	34	21	-0.736	0.000
U	87.5	207.0	63.0		



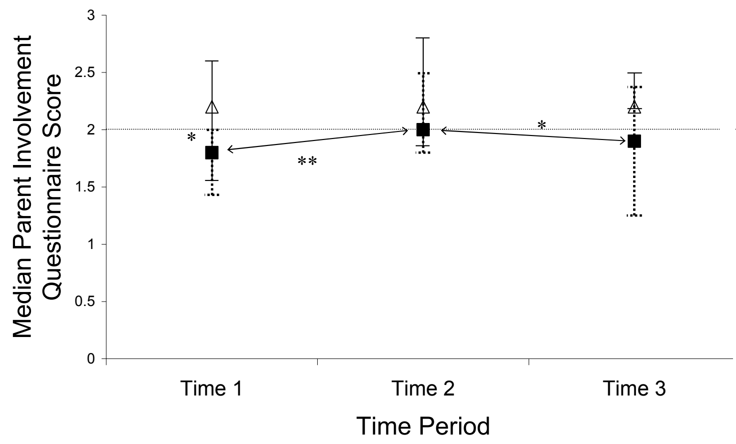
	n by time period			*z*	
	1	2	3	Time 1- Time 2	Time 2 - Time 3
VI	20	20	12	-0.970	-1.478
CL	36	34	21	-1.842	-2.314
U	339.0	271.5	115.5		

Figure 5.9. Adult involvement medians and interquartile ranges of children with and without vision impairment by time period

Note. QuIEM = Quality of Inclusive Experiences Measure; *U* = Mann-Whitney *U* score; z = Wilcoxon *z* score.
* $p < .05$. ** $p < .01$. ***$p < .001$.

Parent involvement: Parent's reported involvement in their child's education (e.g. home, school and conferences) was measured by the Parent Involvement Questionnaire. At the start of the study, parents of children with vision impairment were more involved in their child's education than parents of classmates ($p > .05$) (Figure 5.10). Classmate parental involvement fluctuated throughout the two years. It significantly increased during the first year ($p < .01$) then decreased by the second year ($p < .05$). However, there was no change in the involvement of parents of children with vision impairment, therefore the involvement scores did not significantly differ between the two groups at Time 2 or Time 3.

Categorical data, however, indicates that parents of children with vision impairment had a significantly higher involvement level (i.e. had more *good* involvement) than classmates: at Time 1 (65%, n = 13, vs. 21.9%, $p < .001$), Time 2 (75%, n = 9 vs. 76.2%, n = 16; $p > .05$) and Time 3 (90.9%, n = 10, vs. 37.5%, n = 6, $p < .01$).



	n by time period			*z*	
	1	2	3	Time 1- Time 2	Time 2 - Time 3
VI	20	18	11	-0.189	-1.845
CL	32	25	16	-2.944	-2.094
U	189.5	196.0	56.0		

Figure 5.10. Parent involvement median and interquartile range of children with and without vision impairment by time period

Note. U = Mann-Whitney U score. z = Wilcoxon z score.
* $p < .05$. ** $p < .01$. *** $p < .001$.

5.6.4 Summary

This section has described the situation that children with vision impairment are exposed to in regular early education in three states in Australia. The adequacy of the factors identified by stakeholders was described, the factors were compared to those experienced by classmates and temporal changes in the factors were monitored.

The adequacy of the stakeholder factors varied among factors and schools. Just over half the children with vision impairment (57.1%) had received early intervention. During the two years, the majority of children with vision impairment (75-91%) demonstrated good social skills, all were educated in classes where teachers described an adequately individualised curriculum, and most (65-100%) were educated in an adequate physical class and school environment. While the attitude of most teachers (70-92%) was positive at each period during the two years, the overall school attitude was different, with 59 to 75% of schools reporting a negative attitude towards including children with disabilities. In addition to school attitude, three factors were commonly low in classes of children with vision impairment: vision aides and equipment (28.6-37.5% *good*), staff support (41.6-66% *good*) and teacher training (26.7-66.7% *good*).

There were three main differences between-groups (or classes) of children with and without vision impairment. (1) While there was no difference in social skills during the first year, children with vision impairment had significantly lower social skills at the end of the second year. (2) Staff and (3) parents were more involved with children with vision impairment. In the class, adults were more over-involved and therefore less appropriately involved with children with vision impairment. Parents of children with vision impairment were more involved in education than parents of classmates at the start of the year.

During the first year, teachers who taught throughout improved the physical environment, and all staff became more appropriately involved with children with vision impairment. Teachers who taught at Time 3 were more positive towards inclusion than those at Time 2, however they were less involved with classmates. While classmates demonstrated improvement in social skills, those with vision impairment did not. Also, their parents' involvement was stable, while classmates' fluctuated over the two years.

5.7 INCLUSIVE OUTCOMES OF CHILDREN WITH AND WITHOUT VISION IMPAIRMENT

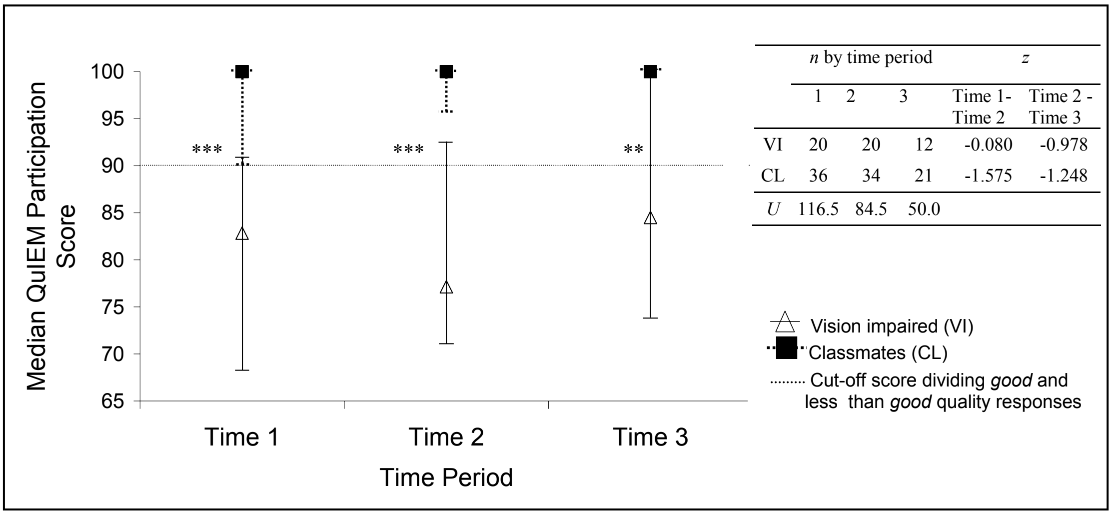
The following section reports on the results of Aim 2. The inclusive outcomes of children with and without vision impairment are compared, and changes over time described. Again, line graphs illustrate between-group comparison and temporal change. Participation is reported, followed by engagement, child interaction, then academic performance. Finally, overall inclusion, as demonstrated by the Inclusion Index is described.

5.7.1 Participation

Classmates had significantly better participation rates than those with vision impairment. Participation referred to being assigned to or involved in class activities rather than sole or one-on-one adult activities. Children with vision impairment had significantly lower QuIEM Participation scores during the two years ($p < .01$) (Figure 5.11). This is supported by categorical data. Significantly fewer children with vision impairment demonstrated a *good* level of participation compared to classmates at Time 1 (25% vs. 83.3%), Time 2 (40% vs. 91.2%) and Time 3 (33.3% vs. 100%) ($p < .001$). The participation of children with or without vision impairment did not change while they were in the original class during the first year, nor during the second year, when they were in another class with a different teacher ($p > .05$).

5.7.2 Engagement

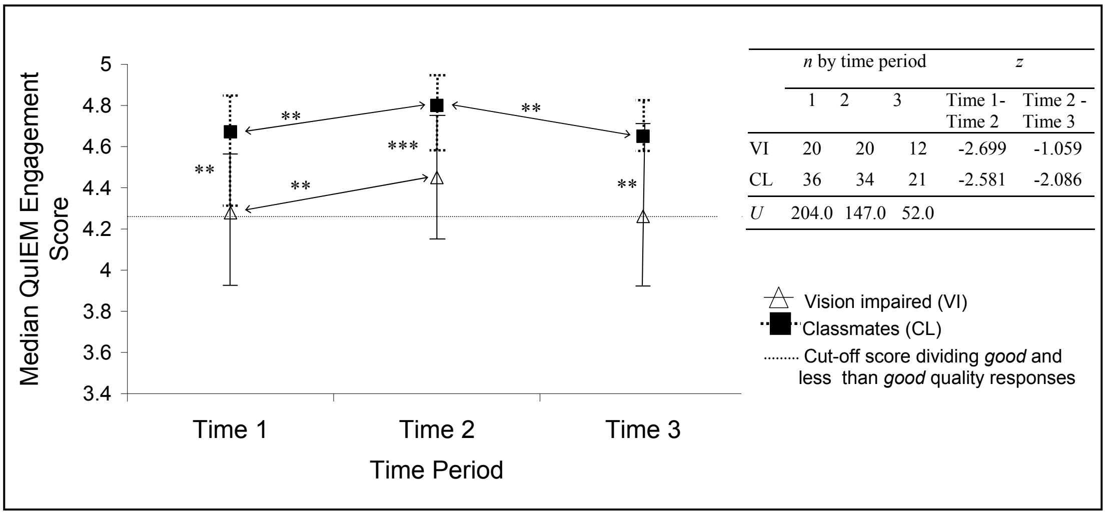
Similarly, children with vision impairment were less engaged in activities (actively involved or attending) than classmates. Their QuIEM Engagement scores were significantly lower than classmates at each point in time ($p < .01$) (Figure 5.12). Categorical data illustrated this. A lower proportion of children with vision impairment achieved a *good* engagement level at each point in time. While this was not significant at Time 1 (55 vs. 80.6%, $p > .05$), it was at Time 2 (65% vs. 94.1%, $p < .01$) and Time 3 (50% vs. 100%, $p < .001$). The engagement of both groups of children improved significantly during the first year, in their original classes ($p < .01$). Children with vision impairment maintained these elevated levels in their next class a year later ($p >.05$), however classmate engagement decreased ($p < .05$). Despite this, classmates were more engaged than peers with vision impairment.



	n by time period			*z*	
	1	2	3	Time 1-Time 2	Time 2 - Time 3
VI	20	20	12	-0.080	-0.978
CL	36	34	21	-1.575	-1.248
U	116.5	84.5	50.0		

Figure 5.11. Participation median and interquartile range of children with and without vision impairment by time period

Note. QuIEM = Quality of Inclusive Experiences Measure; *U* = Mann-Whitney *U* score; *z* = Wilcoxon *z* score.
* $p < .05$. ** $p < .01$. *** $p < .001$.



	n by time period			*z*	
	1	2	3	Time 1-Time 2	Time 2 - Time 3
VI	20	20	12	-2.699	-1.059
CL	36	34	21	-2.581	-2.086
U	204.0	147.0	52.0		

Figure 5.12. Engagement median and interquartile range of children with and without vision impairment by time period

Note. QuIEM = Quality of Inclusive Experiences Measure; *U* = Mann-Whitney *U* score; *z* = Wilcoxon *z* score.
*, $p < .05$. **, $p < .01$. *** $p < .001$

5.7.3 Child Interaction

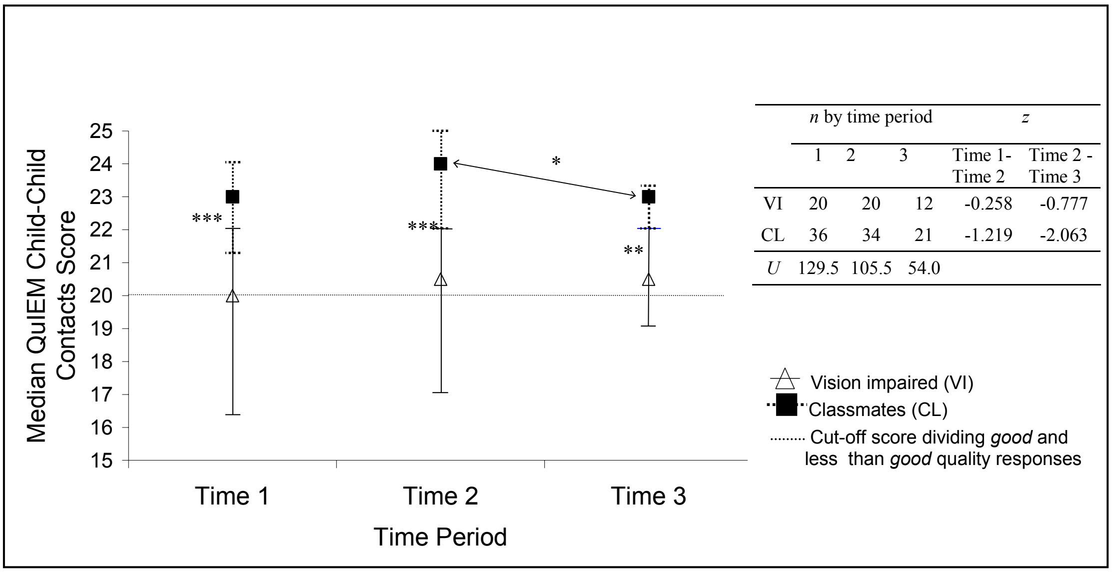
Classmates consistently demonstrated better child interaction than children with vision impairment. This interaction consisted of frequency of interaction, initiation of interaction, reciprocation of interaction by the observed child and by others, and the nature of interactions. Children with vision impairment had significantly lower QuIEM Total Child Interaction scores than classmates at each point in time ($p < .001$ to $p < .05$) (Figure 5.13). In addition, significantly fewer children with vision impairment attained *good* levels of interaction during the first year – at Time 1 (55.0% vs. 94.4%, $p < .001$) and Time 2 (55.0% vs. 97.1%, $p < .001$). The differences were not significant at the end of the second year (66.7% vs. 90.5%, $p > .05$).

The interaction of children with vision impairment did not change significantly over the two years ($p > .05$). However, classmates demonstrated a slight but significant decrease in QuIEM Child Interaction Total scores during the final year ($p < .05$). Despite this, classmates continued to demonstrate significantly better child interaction than children with vision impairment.

5.7.4 Academic Performance

Academic performance related to the reading, mathematic and overall academic ability of the students, as well as student and parent motivation to achieve (relative to classroom peers). During the first year, the SSRS academic performance of children with vision impairment did not significantly differ to classmates ($p > .05$) (Figure 5.14). However, at the end of the second year, children with vision impairment had significantly poorer SSRS academic scores than classmates ($p < .05$).

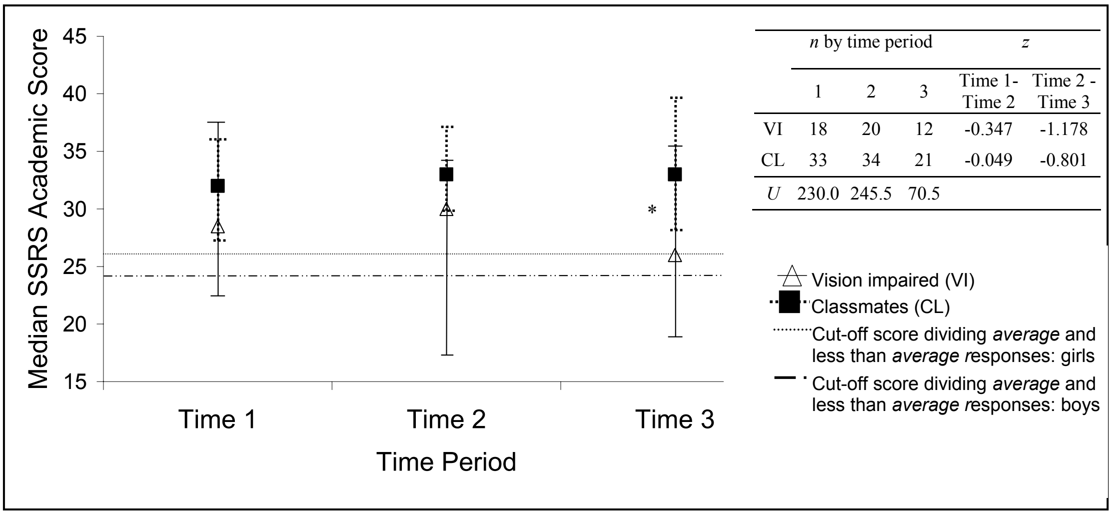
Categorical data reflected this gradual widening of academic ratings of the two groups over time. At the start of the study there was no difference between academic levels, with similar proportions of children with vision impairment and classmates attaining *good* academic levels (77.8% vs. 87.9%, $p > .05$), however, at Time 2 (60.0% vs. 88.2%, $p < .05$) and Time 3 (58.3% vs. 90.5%, $p > .05$, n.s.) fewer children with vision impairment compared to classmates attained *good* academic performance.



	n by time period			*z*	
	1	2	3	Time 1- Time 2	Time 2 - Time 3
VI	20	20	12	-0.258	-0.777
CL	36	34	21	-1.219	-2.063
U	129.5	105.5	54.0		

Figure 5.13. Child interaction median and interquartile range of children with and without vision impairment over time

Note. QuIEM = Quality of Inclusive Experiences Measure; *U* = Mann-Whitney *U* score; *z* = Wilcoxon *z* score.
* $p < .05$. ** $p < .01$. *** $p < .001$.



	n by time period			*z*	
	1	2	3	Time 1- Time 2	Time 2 - Time 3
VI	18	20	12	-0.347	-1.178
CL	33	34	21	-0.049	-0.801
U	230.0	245.5	70.5		

Figure 5.14. Academic performance median and interquartile range of children with and without vision impairment by time period

Note. SSRS = Social Skills Rating System; *U* = Mann-Whitney *U* score; *z* = Wilcoxon *z* score.
* $p < .05$. ** $p < .01$. ***$p < .001$.

5.7.5 Overall Inclusion

A combined Inclusion Index reflected the number of *good* participation, engagement, child interaction and academic outcomes that children achieved during the two years (Table 5.9). A greater proportion of classmates attained high Inclusion Index scores, and a greater proportion of children with vision impairment attained low Inclusion Index scores. During the two years, 16.7 to 22.2% of children with vision impairment experienced an Inclusion Index of zero - representing *poor* performance in all four outcomes. No classmates demonstrated this. On the other hand, while 50 to 85.7% of classmates had an Inclusion Index score of 4 (successful performance in all four outcomes) during the two year period, only 11.1 to 35% of children with vision impairment attained this level of overall inclusion.

Table 5.9. Inclusion Index score by vision impairment status and time period

Inclusion Index [a]	*n* (%)					
	Time 1		Time 2		Time 3	
	Vision impaired	Classmate	Vision impaired	Classmate	Vision impaired	Classmate
0	4 (22.2)		4 (20.0)		2 (16.7)	
1	3 (16.7)	1 (3.1)	4 (20.0)		4 (33.3)	
2	4 (22.2)	2 (6.2)	3 (15.0)	1 (2.9)	1 (8.3)	1 (4.8)
3	5 (27. 8)	13 (40.6)	2 (10.0)	8 (23.5)	2 (16.7)	2 (9.5)
4	2 (11.1)	16 (50.0)	7 (35.0)	25 (73.5)	3 (25.0)	18 (85.7)
Missing [b]	2	5	0	3	1	0
Total	20	37	20	37	13	21

Note. Only participants with complete data were included in analysis at each time period.
[a] Total number of *good* outcomes out of child interaction, participation, engagement and academic performance.
[b] Missing data refers to one or more outcome measurements missing due to unreturned questionnaires or child absence for school observation.

5.7.6 Summary

This section reported on the inclusive outcomes experienced by children with vision impairment. Their outcomes were compared to classmates, described categorically and temporal changes were reported.

Children with vision impairment consistently participated in fewer class activities, were less engaged in activities and had poorer child interaction compared to classmates. Their performance was significantly poorer at each point over the two years. The academic performance of children with and without vision impairment did not differ at the beginning of the study, but differences emerged over the two years, such that at the end of the two years children with vision impairment had significantly worse academic performance than classmates.

There were some interesting changes in inclusive outcomes over one and two years among children with and without vision impairment. The engagement of both groups of children increased significantly during the first year. Children with vision impairment did not experience any other change in their outcomes during the two years. On the other hand, the child interaction and engagement of classmates actually decreased significantly from the end of the first year to the end of the second year.

Some children with vision impairment attained successful outcomes during the two years. Twenty five to 40% achieved *good* participation, 50 to 65% *good* engagement, 55 to 66.7% *good* child interaction, and 58.3 to 77.8% *good* academic performance. However, a greater proportion of children with vision impairment experienced *poor* performance in all aspects of overall inclusion than their classmates, whereas more classmates attained *good* performance in all aspects of inclusion.

The results indicate that it is possible for children with vision impairment to achieve successful inclusive outcomes. However, many of these children continue to experience poor levels of inclusion, and they are consistently lower than that of classmates. The previous section identified that there was a similar variance in the situation in which children with vision impairment are educated. The next section identifies whether those stakeholder factors can explain the variation in inclusive outcomes among children with vision impairment.

5.8 FACTORS INFLUENCING INCLUSIVE OUTCOMES

This section presents the results of the first objective of Aim 3. The individual factors that influenced the performance of children with vision impairment one year and two years later are reported. A three-step process was used to select the individual predictors of inclusive outcomes for children with vision impairment. This involved: Step (1) between and within-group univariate logistic regression, Step (2) within-group Mann-Whitney *U* test, and Step (3) differential between-group Mann-Whitney *U* test (see section 4.9.3).

The significant final results of the three-step process are presented in this section. The factors that were significant at step 1 underwent step 2 and step 3 analysis. The significant results at each point in time are summarised in table form. The complete results of step 1 (univariate logistic regression) then steps 2 and 3 (Mann-Whitney U Tests), including significant and non-significant results, are presented in table form in Appendix V (presented by outcome variable and time period). For the sake of brevity, the significant results of steps 2 and 3 are presented in pictorial form in this section. These figures depict the group differences between children with and without vision impairment in *good* and *poor* conditions, and also illustrate the direction that each individual factor influences the outcomes.

Since this was a multifaceted process, a detailed example of the results of each step is provided for one stakeholder factor and outcome: the influence of social skills on the participation of children with vision impairment over one year (Figure 5.15). Following this, the individual factors that influenced the participation of children with vision impairment are reported. The factors that influence engagement, child interaction, and academic performance then follow.

Step 1: **Univariate logistic regression**	Step 2: **Within-groups Mann-Whitney *U***	Step 3*:* **Between-group Mann-Whitney *U***
• **Within-groups analysis**. There were no significant results; children with vision impairment who had *good* social skills at the start of the year were no more likely than children with vision impairment with *poor* social skills to have successful (*good*) participation at Time 2 (see able 10 and Appendix Table V.1). • **Between-group analysis**. Classmates with *good* social skills at the start of the year were 35 times more likely than children with vision impairment with *poor* social skills to have successful participation at the end of the year. They were only 10 times more likely than children with vision impairment with *good* social skills to achieve successful participation at the end of the year. • Classmates with *poor* social skills were not significantly more likely than children with vision impairment to have successful participation. • Because at least one of these tests (between or within-groups) was statistically significant, social skills was considered for the next step.	• Children with vision impairment who had *good* social skills at the start of the year had significantly higher participation scores at the end of the year than children with vision impairment who had *poor* social skills (Figure 5.16 and Appendix Table V2, row 1). • The median scores and interquartile range confirmed that social skills had a significantly *positive* influence. • Because this was significant, social skills was immediately selected as an individual factor.	• The participation of classmates with *poor* social skills was not statistically different to the participation of either group of children with vision impairment (Figure 5.16 and Appendix Table V.2). • Classmates with *good* social skills had significantly higher participation scores at the end of the year than children with vision impairment with *good* and *poor* social skills. • Since the *good* classmate group differed to <u>both</u> children with vision impairment with *good* and *poor* social skills, this result was not considered differential. These results did not count towards the decision process. • A differential result is illustrated for teacher training and experience (Figure 5.16), where the participation of classmates in a *poor* condition was significantly higher than children with vision impairment in a *poor* condition, but not significantly different to children with vision impairment in a *good* situation.

Figure 5.15. Example of three step process to select individual factors: social skills and participation within one year

Note. See Table 5.10, row 1, for a summary of the results of the three-step process.

Table 5.10. Results of the three step process to select individual factors (by time period) and Participation Index

Time 1 stakeholder and demographic variables	Time 2				Time 3				Participation Index
	Step 1	Step 2	Step 3	Individual Factors	Step 1	Step 2	Step 3	Individual Factors	
Social skills	**	**		+	**	**	**	+	+
Early intervention	*				***		***	-	-
School attitude	*				*				
Teacher attitude	*				*		**	+	+
Staff support	*				*				
Individualisation	**				**				
Teacher training & exp.	*		***	+	*				+
Vision aides & equip.	***				***		***	+	+
Physical environment	***				*	*	**	+	+
Adult Involvement	*				***		***	+	+
Parent involvement	*				*		*	-	-
VI severity	*								
Co-existing disability	*				*	**	***	-	-
Socio-economic status	*				*		*	+	+

Note. Step 1 = Between-group (children with and without vision impairment) and/or within-group (children with vision impairment) univariate logistic regression of children with an.
Step 2 = Within-group Mann-Whitney *U* analysis (of children with vision impairment). Step 3 = Differential Between-group Mann-Whitney *U* analysis (children with and without vision impairment).
+ = factor has a positive influence; - = factor has a negative influence; Exp = experience; Equip = equipment; VI = Vision impairment.
* $p < .05$. ** $p < .01$. *** $p < .001$.

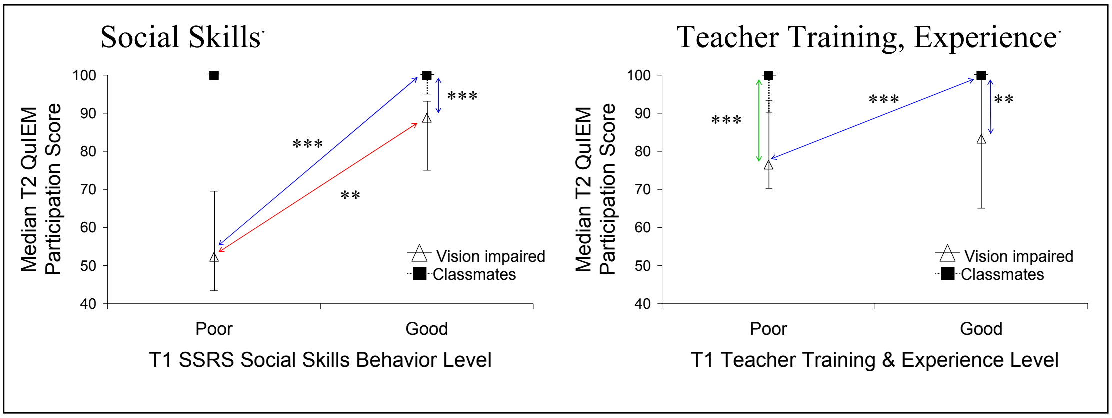


Figure 5.16. Significant Step 2 and 3 results: individual factors influencing participation of children with vision impairment over one year

Note. T1 = Time 1; T2 = Time 2.
Step 2: Within-group Mann-Whitney *U* difference among children with vision impairment.
Step 3: Between-group Mann-Whitney difference among classmates in *good* condition & children with vision impairment.
Step 3: Between-group Mann-Whitney difference among classmates in *poor* condition & children with vision impairment.
* $p < .05$. ** $p < .01$. *** $p < .001$.

5.8.1 Factors Influencing Participation

The three step decision process (Appendix Tables V.1, V.2) found that two factors influenced the participation of children with vision impairment within one year: (1) social skills and (2) teacher training and experience (Table 5.10). Each of these had a positive influence on participation (Figure 5.16).

Interestingly, two years later, nine factors were significant. Seven stakeholder factors and two demographic factors significantly influenced the participation of children with vision impairment (Appendix Tables V.3 and V.4) (Table 5.10). (1) Social skills, (2) physical environment, (3) teacher attitude, (4) vision aides and equipment, and (5) adult involvement all positively influenced participation. In contrast, (6) having had early intervention and (7) high parental involvement had a negative influence on the participation of children with vision impairment (Figure 5.17). In addition, the presence of a co-existing disability had a negative influence and socio-economic status had a positive impact on the participation of children with vision impairment two years later.

Finally, only one factor, social skills, influenced participation after both one and two years

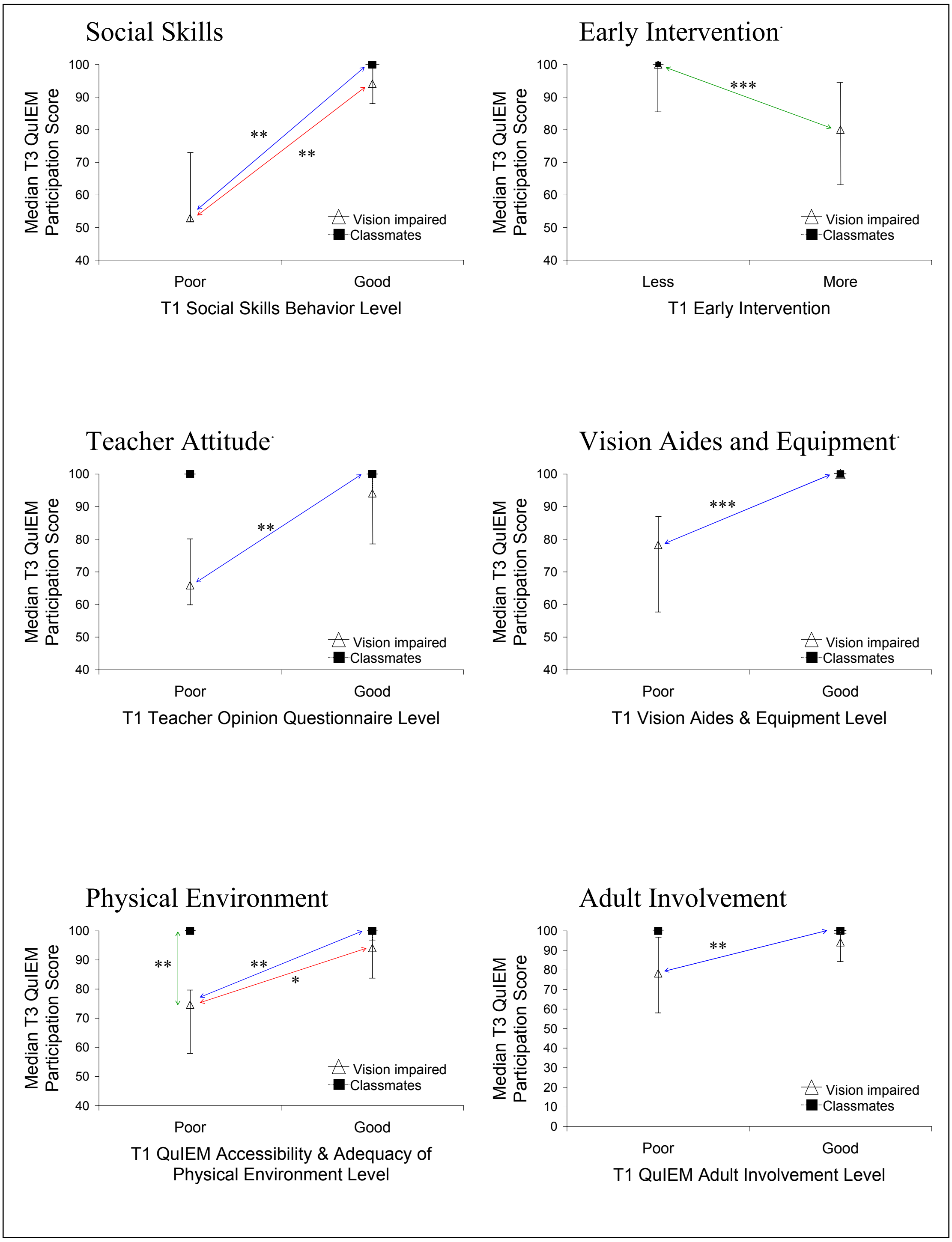


Figure 5.17. Significant Step 2 and 3 results: Individual factors influencing participation of children with vision impairment over two years

(figure continues)

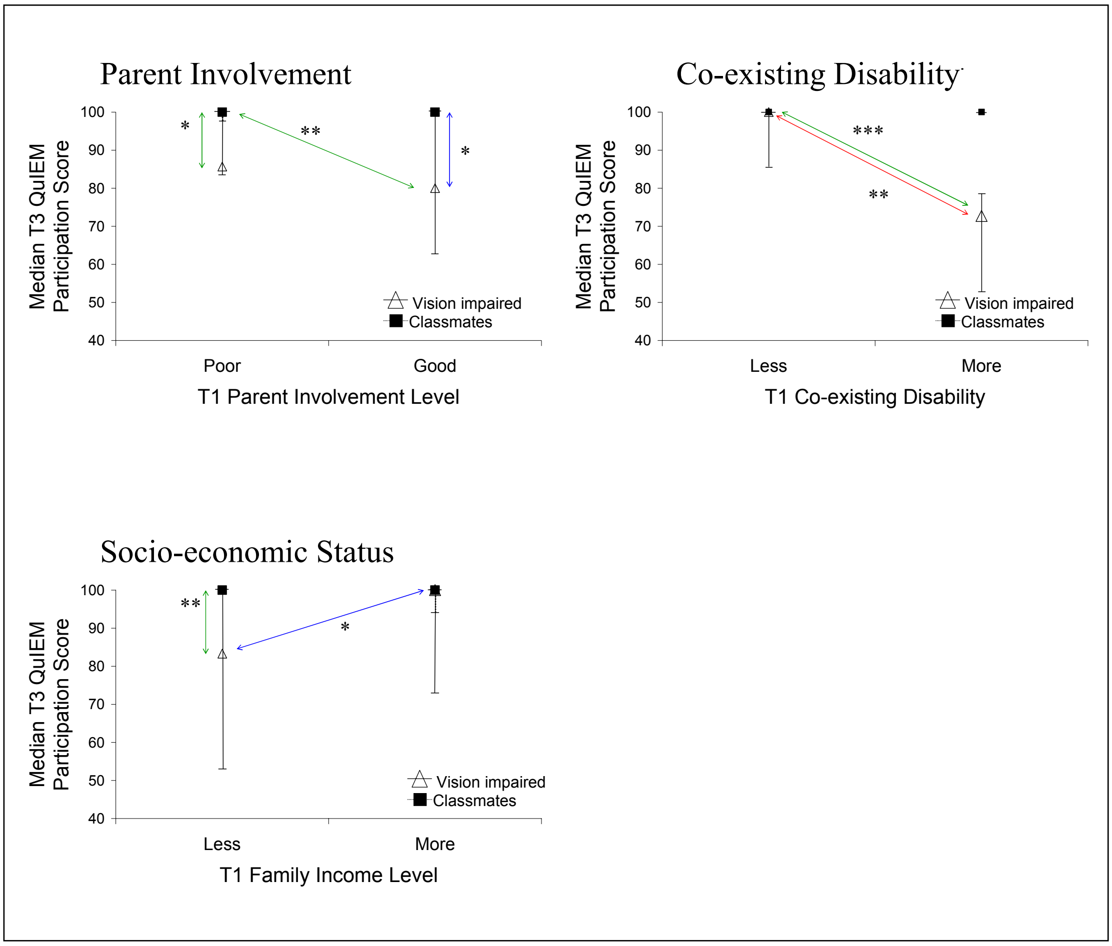


Figure 5.17. ***(continued)***
Note. T1 = Time 1; T3 = Time 3.
Step 2: Within-group Mann-Whitney *U* difference among children with vision impairment.
Step 3: Between-group Mann-Whitney difference among classmates in *good* condition & children with vision impairment.
Step 3: Between-group Mann-Whitney difference among classmates in *poor* condition & children with vision impairment.
* $p < .05$. ** $p < .01$. *** $p < .001$.

5.8.2 Factors Influencing Engagement

The three-step process (Appendix Tables V.5, V.6) resulted in six factors that influenced the engagement of children with vision impairment within one year (Table 5.11). Of these, four stakeholder factors had a positive influence: (1) individualisation, (2) teacher training and experience, (3) physical environment, and (4) adult involvement (Figure 5.18). Two demographic factors also influenced engagement: (5) severity of vision impairment had a positive impact (children with *more* severe vision impairment were more likely to attain high engagement scores) and (6) the presence of a co-existing disability had a negative impact.

The Time 3 engagement of children with vision impairment was influenced by 10 different factors (Appendix Tables V.7, V.8 and Table 5.11). Five stakeholder factors were positive: (1) social skills, (2) teacher attitude, (3) vision aides and equipment, (4) physical environment, and (5) parent involvement; and three were negative: (6) staff support, (7) early intervention, and (8) parent involvement.(Figure 5.19). In addition, two demographic factors influenced the engagement of children with vision impairment after two years: (9) the presence of co-existing disability status had a negative effect and (10) socio-economic status had a positive effect. Three of these factors (physical environment, adult involvement and co-existing disabilities) influenced engagement over both one and two years.

5.8.3 Factors Influencing Child Interaction

The three-step selection process (Appendix Tables V.9, V.10) resulted in six individual factors that influenced child interaction of children with vision impairment within one year (Table 5.12). Of these, four stakeholder factors: (1) social skills, (2) teacher attitude, (3) teacher training and experience, and (4) adult involvement; and one demographic factor, (5) socio-economic status had a positive impact (Figure 5.20). However, (6) the presence of a co-existing disability had a negative impact on child interaction within one year.

Three of these factors also had a significant influence on the interaction of children with vision impairment two years later (Appendix V.11, V.12): (1) teacher attitude, (2) adult involvement and (3) socio-economic status (Figure 5.21). Each factor positively influenced child interaction.

Table 5.11. Results of the three step process to select individual factors (by time period) and Engagement Index

Time 1 stakeholder and demographic variables	Time 2				Time 3				Engagement Index
	Step 1	Step 2	Step 3	Individual Factors	Step 1	Step 2	Step 3	Individual Factors	
Social skills	*				**		*	+	+
Early intervention					**		***	-	+
School attitude									
Teacher attitude					*		*	+	+
Staff support					*		*	-	-
Individualisation	**	*		+	**				+
Teacher training & exp.	*		*	+	*				+
Vision aides & equip.	*				***		***	+	+
Physical environment	*		*	+	*		**	+	+
Adult Involvement	*		***	+	**		**	+	+
Parent involvement					**		**	-	-
VI severity	*		**	+					+
Co-existing disability	*	*	*	-	***		***	-	-
Socio-economic status	*				*		*	+	+

Note. Step 1 = Between-group (children with and without vision impairment) and/or within-group (children with vision impairment) univariate logistic regression of children with an.
Step 2 = Within-group Mann-Whitney *U* analysis (of children with vision impairment); Step 3 = Differential Between-group Mann-Whitney *U* analysis (children with and without vision impairment).
+ = factor has a positive influence; - = factor has a negative influence; Exp = experience; Equip = equipment; VI = Vision impairment.
* $p < .05$. ** $p < .01$. *** $p < .001$.

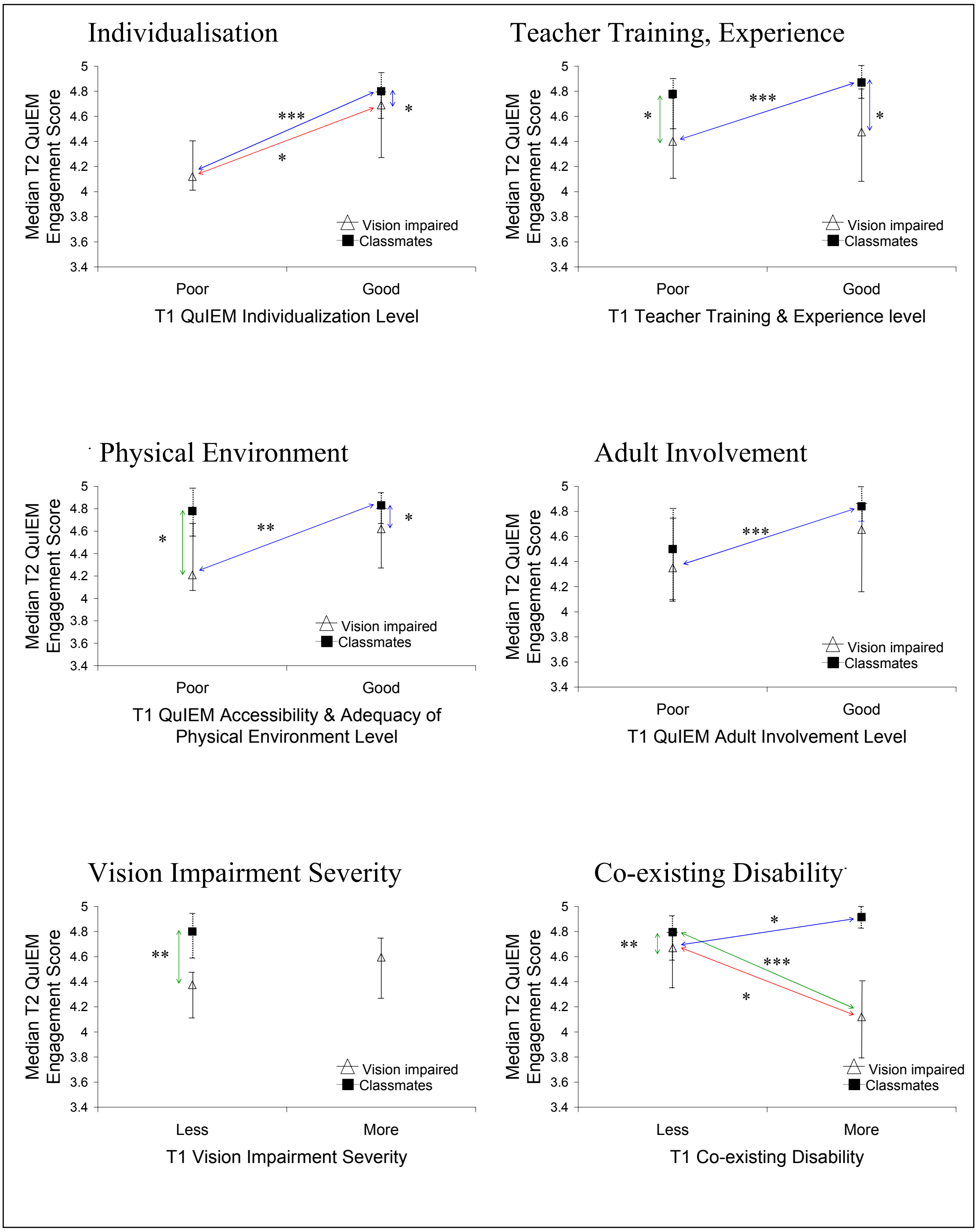


Figure 5.18. Significant Step 2 and 3 results: Individual factors influencing the engagement of children with vision impairment within one year

Note. T1 = Time 1; T2 = Time 2.
Step 2: Within-group Mann-Whitney *U* difference among children with vision impairment.
Step 3: Between-group Mann-Whitney difference among classmates in *good* condition & children with vision impairment.
Step 3: Between-group Mann-Whitney difference among classmates in *poor* condition & children with vision impairment.
* *p* < .05. ** *p* < .01. *** *p* < .001.

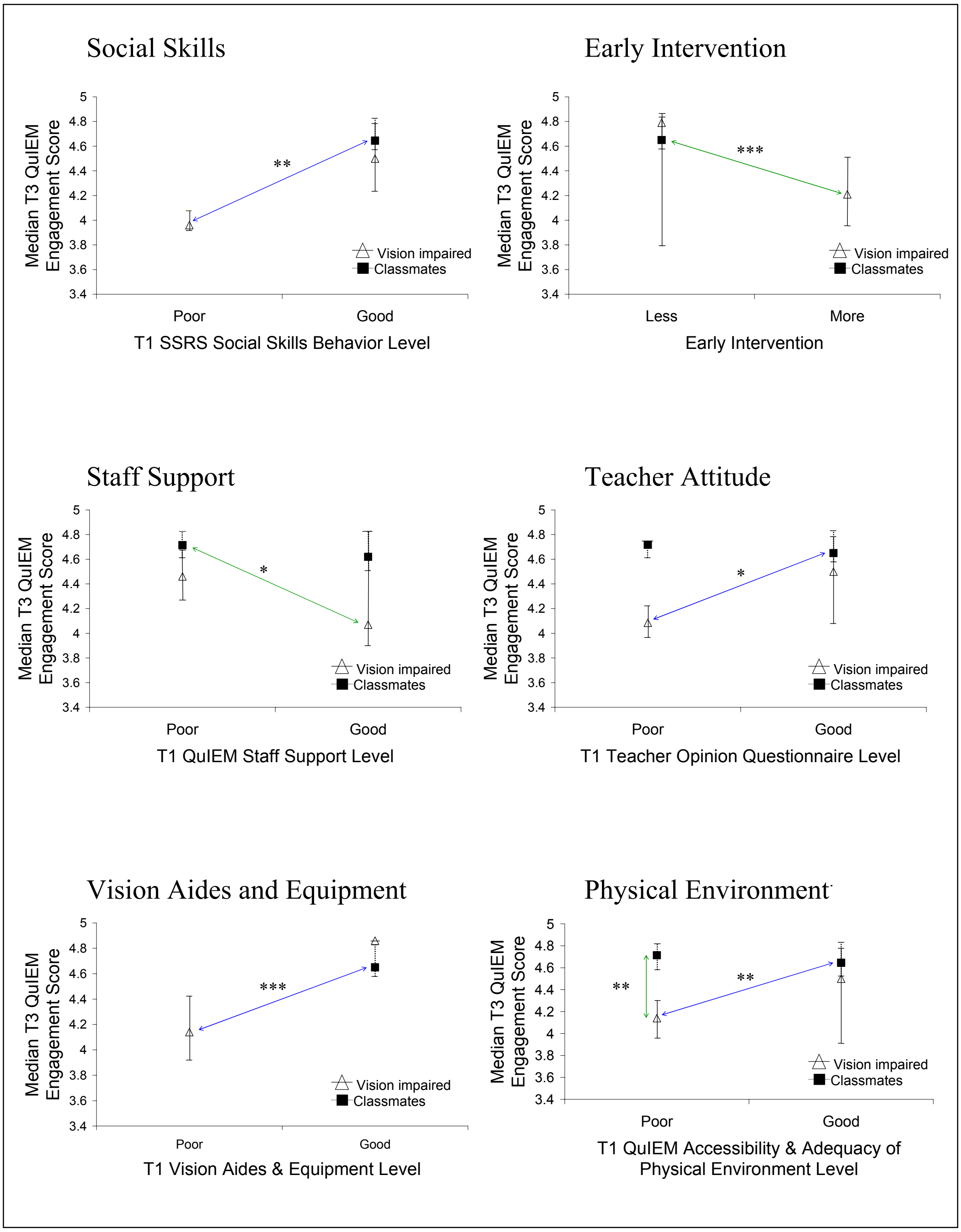


Figure 5.19. Significant Step 2 and 3 results: Individual factors influencing the engagement of children with vision impairment two years later

(figure continues)

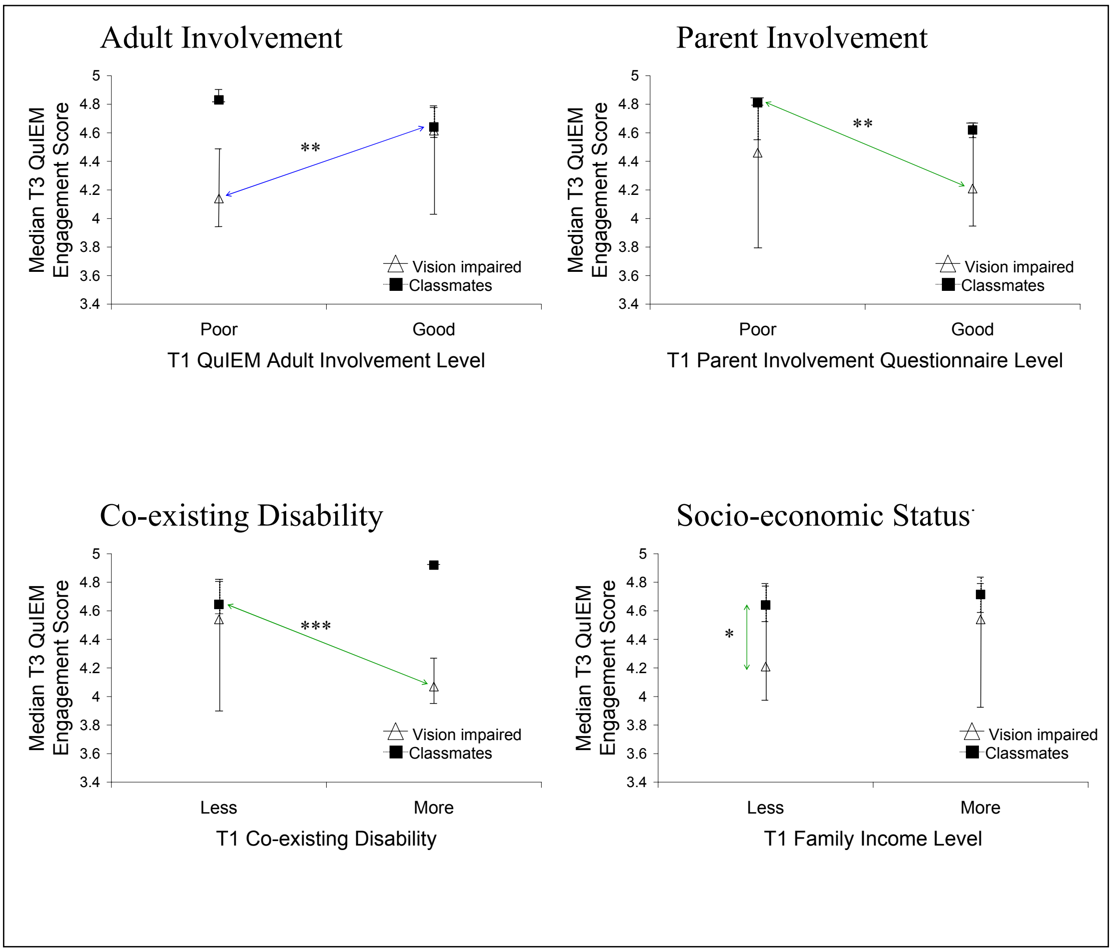


Figure 5.19. ***(continued)***

Note. T1 = Time 1; T3 = Time 3.
Step 2: Within-group Mann-Whitney *U* difference among children with vision impairment.
Step 3: Between-group Mann-Whitney difference among classmates in *good* condition & children with vision impairment.
Step 3: Between-group Mann-Whitney difference among classmates in *poor* condition & children with vision impairment.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 5.12. Results of the three step process to select individual factors (by time period) and Child Interaction Index

Time 1 stakeholder and demographic variables	Time 2				Time 3				Child Interaction Index
	Step 1	Step 2	Step 3	Individual Factors	Step 1	Step 2	Step 3	Individual Factors	
Social skills	*	***		+					+
Early intervention	*								
School attitude	*								
Teacher attitude	*	**		+	*	*	*	+	+
Staff support	*								
Individualisation	*								
Teacher training & exp.	**		***	+					+
Vision aides & equip.	***								
Physical environment	*								
Adult Involvement	***		**	+	*		**	+	+
Parent involvement	*								
VI severity									
Co-existing disability	*	*		-					-
Socio-economic status	*		**	+	*		*	+	+

Note. Step 1 = Between-group (children with and without vision impairment) and/or within-group (children with vision impairment) univariate logistic regression of children with an.
Step 2 = Within-group Mann-Whitney *U* analysis (of children with vision impairment); Step 3 = Differential Between-group Mann-Whitney *U* analysis (children with and without vision impairment).
+ = factor has a positive influence; - = factor has a negative influence; Exp = experience; Equip = equipment; VI = Vision impairment.
* $p < .05$. ** $p < .01$. *** $p < .001$.

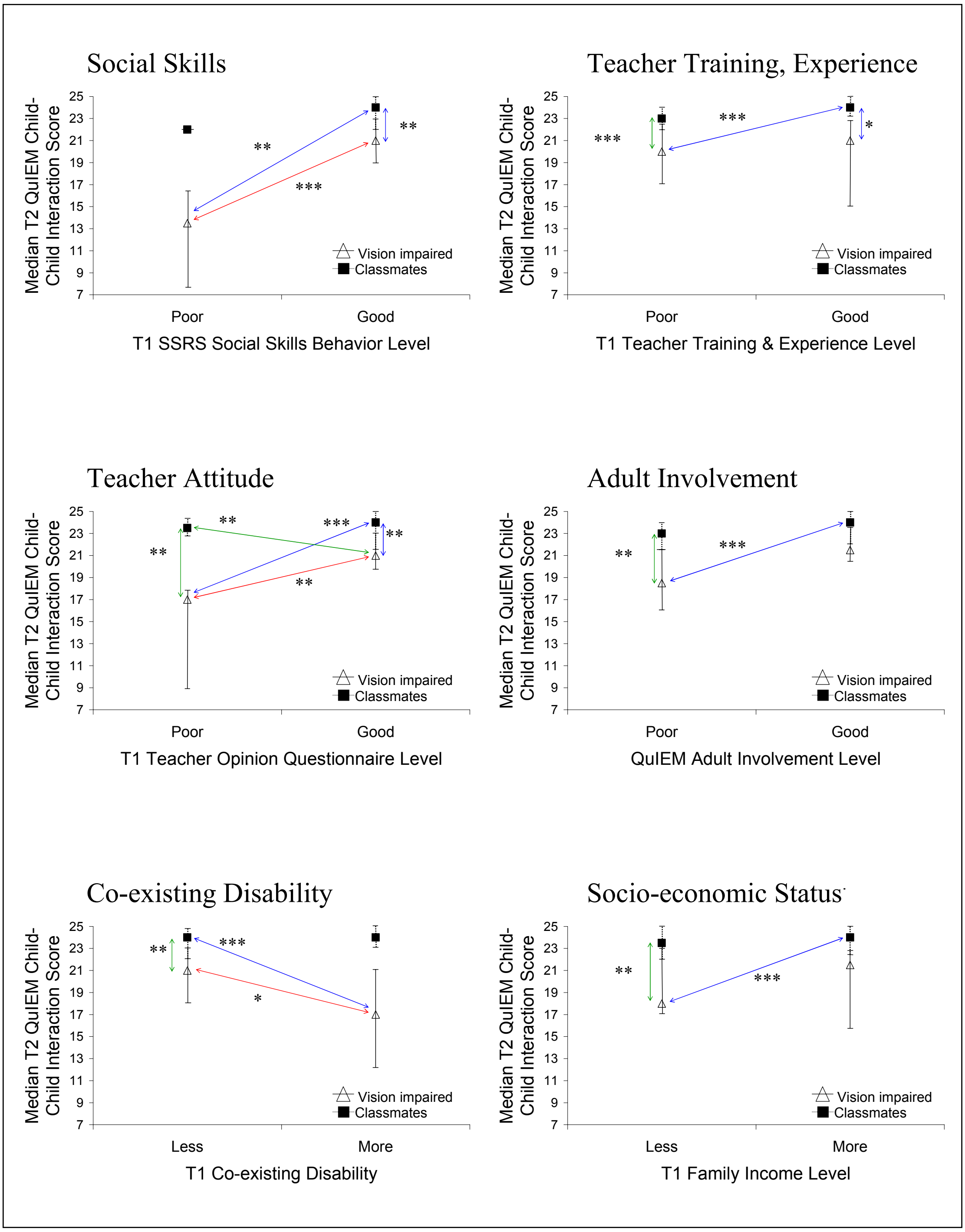


Figure 5.20. Significant Step 2 and 3 results: Individual factors influencing child interaction of children with vision impairment within one year

Note. T1 = Time 1; T2 = Time 2.
Step 2: Within-group Mann-Whitney *U* difference among children with vision impairment.
Step 3: Between-group Mann-Whitney difference among classmates in *good* condition & children with vision impairment.
Step 3: Between-group Mann-Whitney difference among classmates in *poor* condition & children with vision impairment.
* $p < .05$. ** $p < .01$. *** $p < .001$.

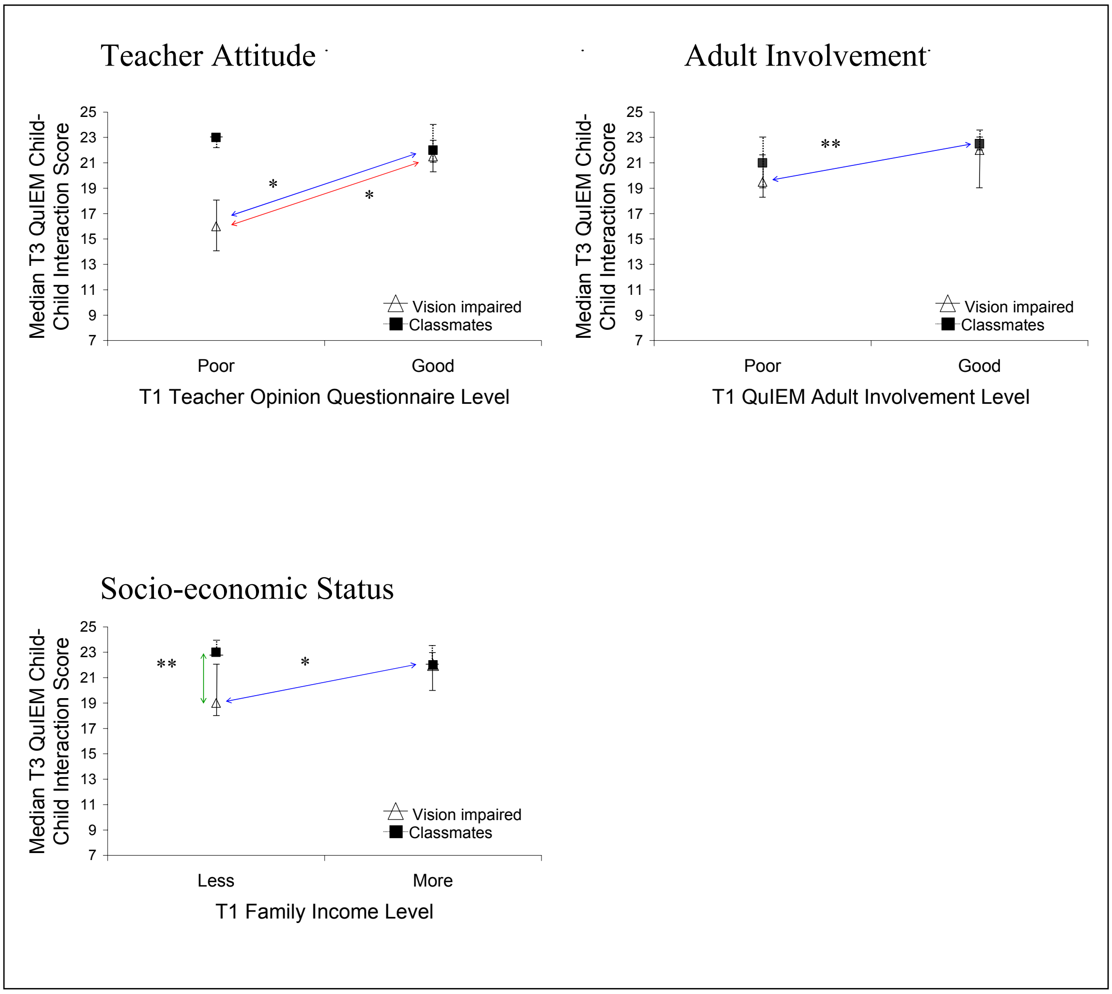


Figure 5.21. Significant Step 2 and Step 3 results: Individual factors influencing Child Interaction of children with vision impairment two years later

Note. T1 = Time 1; T3 = Time 3.
Step 2: Within-group Mann-Whitney *U* difference among children with vision impairment.
Step 3: Between-group Mann-Whitney difference among classmates in *good* condition & children with vision impairment.
Step 3: Between-group Mann-Whitney difference among classmates in *poor* condition & children with vision impairment.
* $p < .05$. ** $p < .01$. *** $p < .001$.

5.8.4 Factors Influencing Academic Performance

The three-step process selected 11 factors that had a significant impact on the academic performance of children with vision impairment over one year: eight stakeholder factors and three demographic variables (Table 5.13 and Appendix Tables V.13, V.14). Most of the stakeholders had a positive influence on academic performance. (1) Social skills, (2) teacher training and experience, (3) teacher attitude, (4) vision aides and equipment, (5) physical environment, (6) adult involvement, and (7) parent involvement all had a positive impact. On the other hand, (8) having had early intervention had a negative influence on academic performance. The demographic factors had a differential influence. (9) Vision impairment severity and (10) the presence of a co-existing disability had a negative effect, while (11) socio-economic status positively influenced the academic performance of children with vision impairment over one year.

While 11 factors were significant over one year, only three factors influenced the academic performance of children with vision impairment two years later: (1) early intervention, (2) school attitude, and (3) vision aides and equipment (Table 5.13 and Appendix Tables V.15, V.16). Early intervention and school attitude had a negative influence, and vision aides and equipment positively influenced academic performance (Figure 5.22).

Two of these individual factors significantly influenced academic performance one and two years later: early intervention had a negative influence and vision aides and equipment had a positive influence.

Table 5.13. Results of the three step process to select individual factors (by time period) and Academic Index

Time 1 stakeholder and demographic variables	Time 2				Time 3				Academic Index
	Step 1	Step 2	Step 3	Individual Factors	Step 1	Step 2	Step 3	Individual Factors	
Social skills	*	**	**	+					+
Early intervention	*		*	-	*		*	-	-
School attitude					**		*	-	-
Teacher attitude	**		*	+					+
Staff support					*				
Individualisation	*								
Teacher training & exp.	*		*	+					+
Vision aides & equip.	**		*	+	*		*	+	+
Physical environment	*		*	+					+
Adult Involvement	*		*	+					+
Parent involvement	*		**	+					+
VI severity	*		*	-					-
Co-existing disability	**	*	***	-					-
Socio-economic status	*		***	+					+

Note. Step 1 = Between-group (children with and without vision impairment) and/or within-group (children with vision impairment) univariate logistic regression of children with an.
Step 2 = Within-group Mann-Whitney *U* analysis (of children with vision impairment); Step 3 = Differential Between-group Mann-Whitney *U* analysis (children with and without vision impairment).
+ = factor has a positive influence; - = factor has a negative influence; Exp = experience; Equip = equipment; VI = Vision impairment.
* $p < .05$. ** $p < .01$. *** $p < .001$.

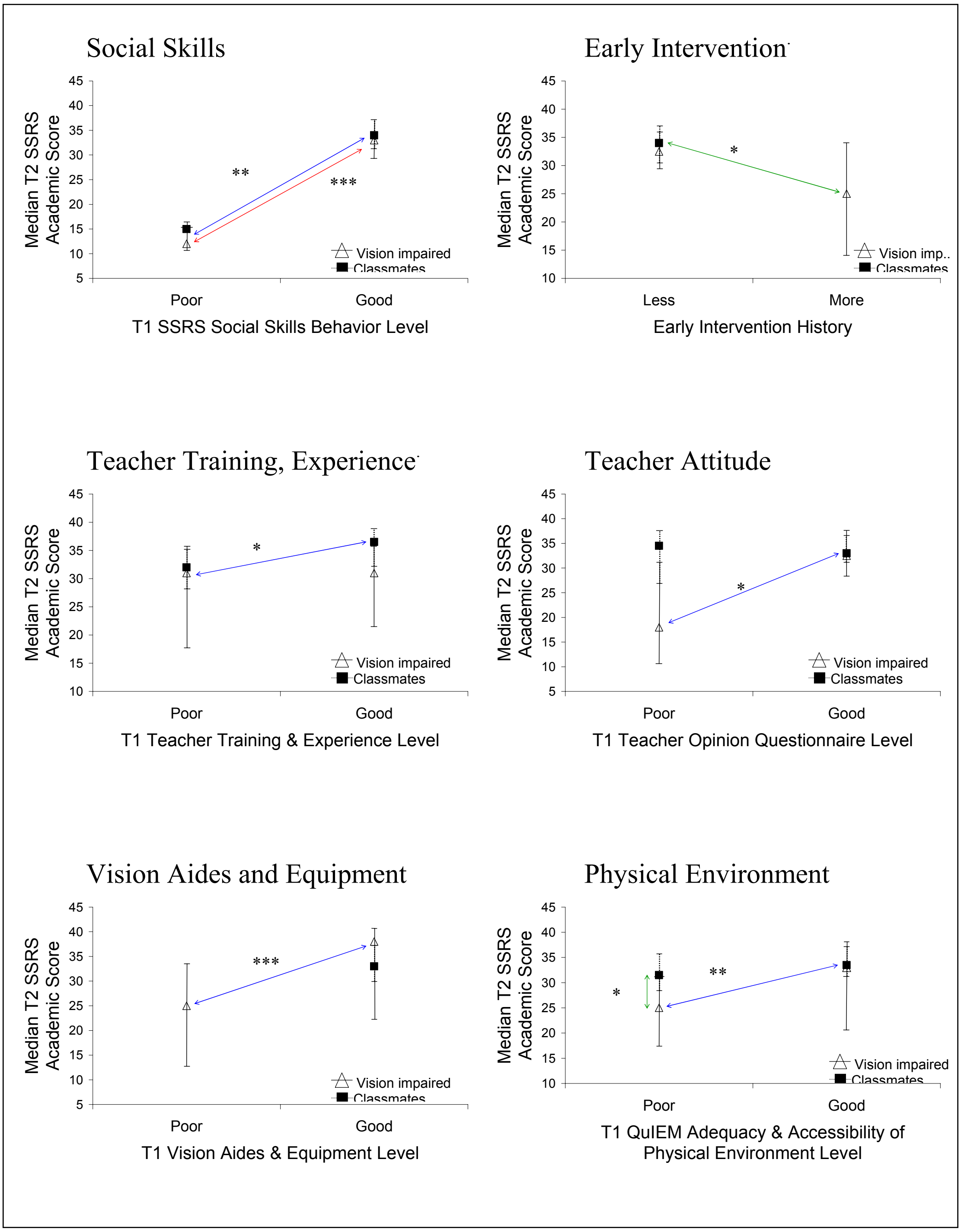


Figure 5.22. Significant Step 2 and 3 results: Individual factors influencing the academic performance of children with vision impairment within one year

(figure continues)

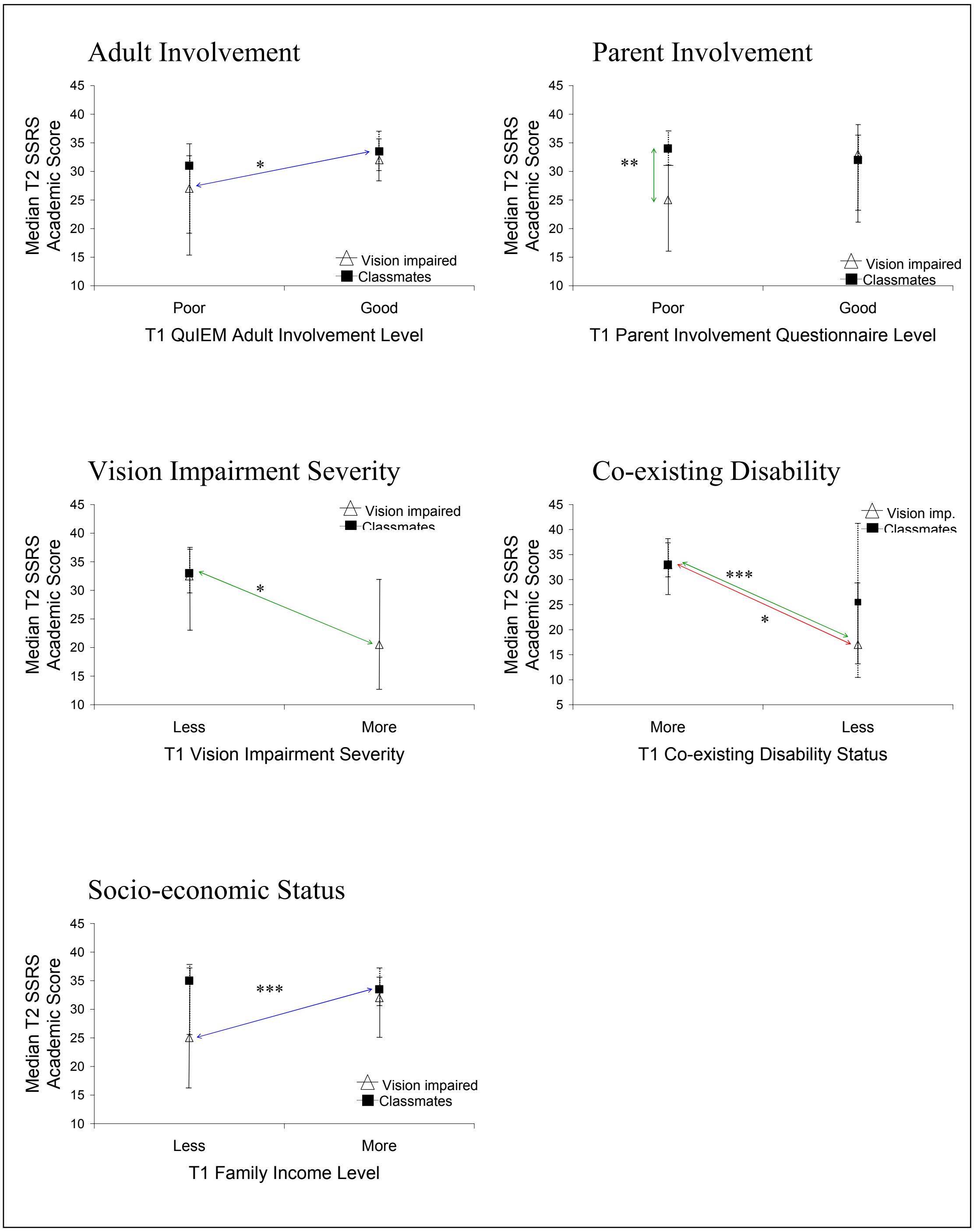


Figure 5.22. ***(continued)***
Note. T1 = Time 1; T2 = Time 2.
Step 2: Within-group Mann-Whitney *U* difference among children with vision impairment.
Step 3: Between-group Mann-Whitney difference among classmates in *good* condition & children with vision impairment.
Step 3: Between-group Mann-Whitney difference among classmates in *poor* condition & children with vision impairment.
* $p < .05$. ** $p < .01$. *** $p < .001$.

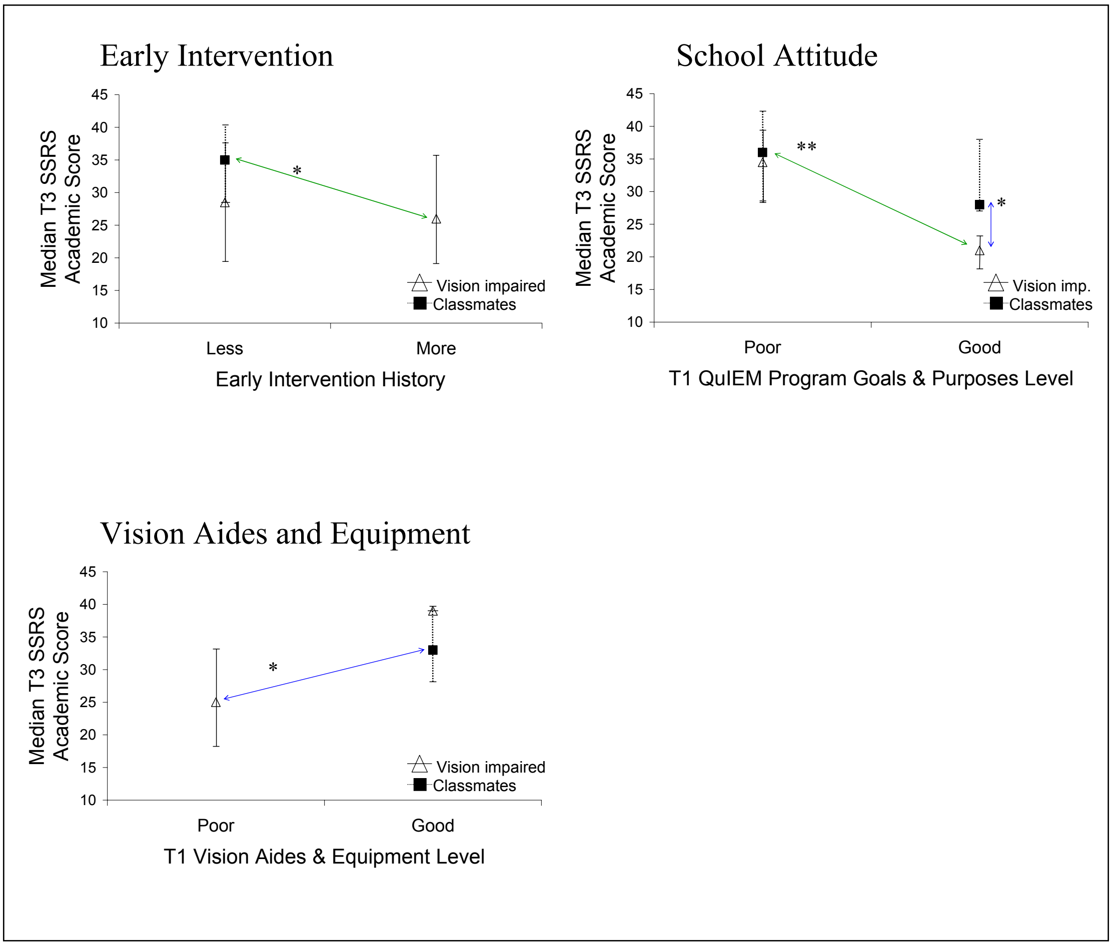


Figure 5.23. Significant Step 2 and 3 results: Individual factors influencing the academic performance of children with vision impairment two years later

Note. T1 = Time 1; T3 = Time 3.
Step 2: Within-group Mann-Whitney *U* difference among children with vision impairment.
Step 3: Between-group Mann-Whitney difference among classmates in *good* condition & children with vision impairment.
Step 3: Between-group Mann-Whitney difference among classmates in *poor* condition & children with vision impairment.
* $p < .05$. ** $p < .01$. *** $p < .001$.

5.8.5 Summary

All stakeholder factors individually had a significant effect on at least one outcome variable over one or two years. Four factors had a significant positive impact on all aspects of inclusion tested (1) social skills, (2) teacher training and experience, (3) teacher attitude and (4) adult involvement (Table 5.14). In addition, two factors had a significant positive influence on three inclusive outcomes: (1) vision aides and equipment and (2) physical environment.

Four individual factors exerted a negative influence on at least one inclusive outcome of children with vision impairment: (1) early intervention, (2) school attitude, (3) staff support, and (4) parent involvement. Parent involvement had a mixed effect on outcomes.

Individually, the demographic factors had a significant influence on the inclusive outcomes of children with vision impairment. Severity of vision impairment had a differential impact on engagement and academic outcomes. On the other hand, co-existing disabilities had a negative influence on all outcomes, and socio-economic status had a significantly positive impact on all outcomes for children with vision impairment.

There were differences in the amount of factors that had an individual influence on the outcomes over one and over two years. For participation and engagement, more individual factors significantly influenced performance two years later (nine and 10 respectively) than one year later (two and six respectively). Child interaction and academic performance were different. More individual factors influenced the performance of these outcomes over one year than over two years. There were some factors that influenced outcomes over *both* one and two years.

Table 5.14. Individual factors influencing inclusive outcomes of children with vision impairment at Time 2 and Time 3

Factors	Outcomes influenced by individual factors			
	Participation	Engagement	Child Interaction	Academic
Stakeholder factors				
Social Skills	+T2, +T3	+T3	+T2, +T3	+T2
Early intervention	-T3	-T3		-T2, -T3
School attitude				-T3
Teacher attitude	+T3	+T3	+T2, +T3	+T2
Staff support		-T3		
Individualisation		+T2		
Teacher training and exp.	+T2	+T2	+T2	+T2
Vision aides & equipment	+T3	+T3		+T2, +T3
Physical environment	+T3	+T2, +T3		+T2
Adult Involvement	+T3	+T2, +T3	+T2, T3	+T2
Parent involvement	-T3	-T3		+T2
Demographic factors				
Severity vision impairment		+T2		-T2
Co-existing disability	-T3	-T2, -T3	-T2	-T2
Socio-economic status	+T3	+T3	+T2, +T3	+T2

Note. T2 = Time 2; T3 = Time 3; + = Significant positive factor; - =Significant negative factor; Exp = Experience.

5.9 HOW MANY FACTORS PREDICT SUCCESSFUL INCLUSIVE OUTCOMES?

This section presents the results of the second objective of the final aim. It determined the minimum number of factors (in a collective Index) required to predict success for children with and without vision impairment. Each collective outcome Index represented the number of significant individual factors that were present at the start of the first year.

The individual factors that comprised the respective outcome Indices (stakeholder and demographic factors) are defined first. Results of the ROC curve analysis are then reported. The AUC determined whether the outcome Index significantly predicted successful outcomes of children with then without vision impairment over one and two years. Sensitivity analysis was conducted to determine whether demographic factors were required to predict success. When results significantly differed, Indices with demographic factors are reported also.

In cases where the Index predicted success, the Index score (curve coordinate) that differentiated between successful and unsuccessful outcomes is reported. As described in section 4.9.4, this score was determined by the sensitivity (proportion of children who would experience successful performance if they had greater than '*k'* number of factors present; true positive) and specificity (the proportion of children who would experience unsuccessful performance if they had '*k'* or less factors present; true negative). Descriptive data are also presented to support this analysis. Participation results are reported first, followed by engagement, child interaction and then academic success.

5.9.1 Participation Success

The Participation Index (the ranked factor that represented the collective individual predictors over one and two years) comprised of: *good* (1) social skills, (2) teacher training & experience, (3) teacher attitude, (4) vision aides and equipment, (5) physical environment, (6) adult involvement; *poor* (7) parent involvement; and *less* (8) early intervention. The Participation Index with demographic predictors also included: *less* (9) co-existing disabilities and *more* (10) socio-economic status.

The Participation Index did not predict the participation success of children with vision impairment over one year (AUC $p > .05$) (Figure 5.24). The raw data however, suggests that the Participation Index score may have a weak influence on participation over one year (Table 5.15 and Table 5.16).

All children with a Participation Index score of less than 2 experienced *poor* participation at the end of the year. As the Participation Index score increased, so too did the proportion of children with vision impairment who attained successful participation (except for a score of 6); and all children with an Index score of 8 demonstrated successful participation one year later.

Similarly, the Participation Index did not accurately predict successful participation of children with vision impairment two years later. However, the Participation Index *plus* demographic factors predicted successful participation with a *good* level of accuracy (AUC = .875, $p < .05$) (Figure 5.24). A Participation Index score of 6 differentiated between successful and unsuccessful participation. This curve coordinate resulted in good sensitivity (.75) and excellent specificity (.875): 75% of children with vision impairment with successful participation two years later had a Participation Index (with demographics) score of 6 or more; and 87.5% with *poor* participation had an Index score of less than 6 (Table 5.17). The raw data support these findings (Table 5.16). The higher the Participation Index (with demographics) score, the more children with vision impairment attained *good* participation two years later.

For classmates, the Participation Index (with and without demographic factors) did not predict the success of over one or two years (Figure 5.24). The area under the ROC curve was not significantly different to .5 at Time 2, and results were unavailable for Time 3 because no classmates had *poor* results. As the raw data indicate, most classmates experienced successful participation at Time 2 (91.2%) and Time 3 (100%) despite the Participation Index score (Table 5.15).

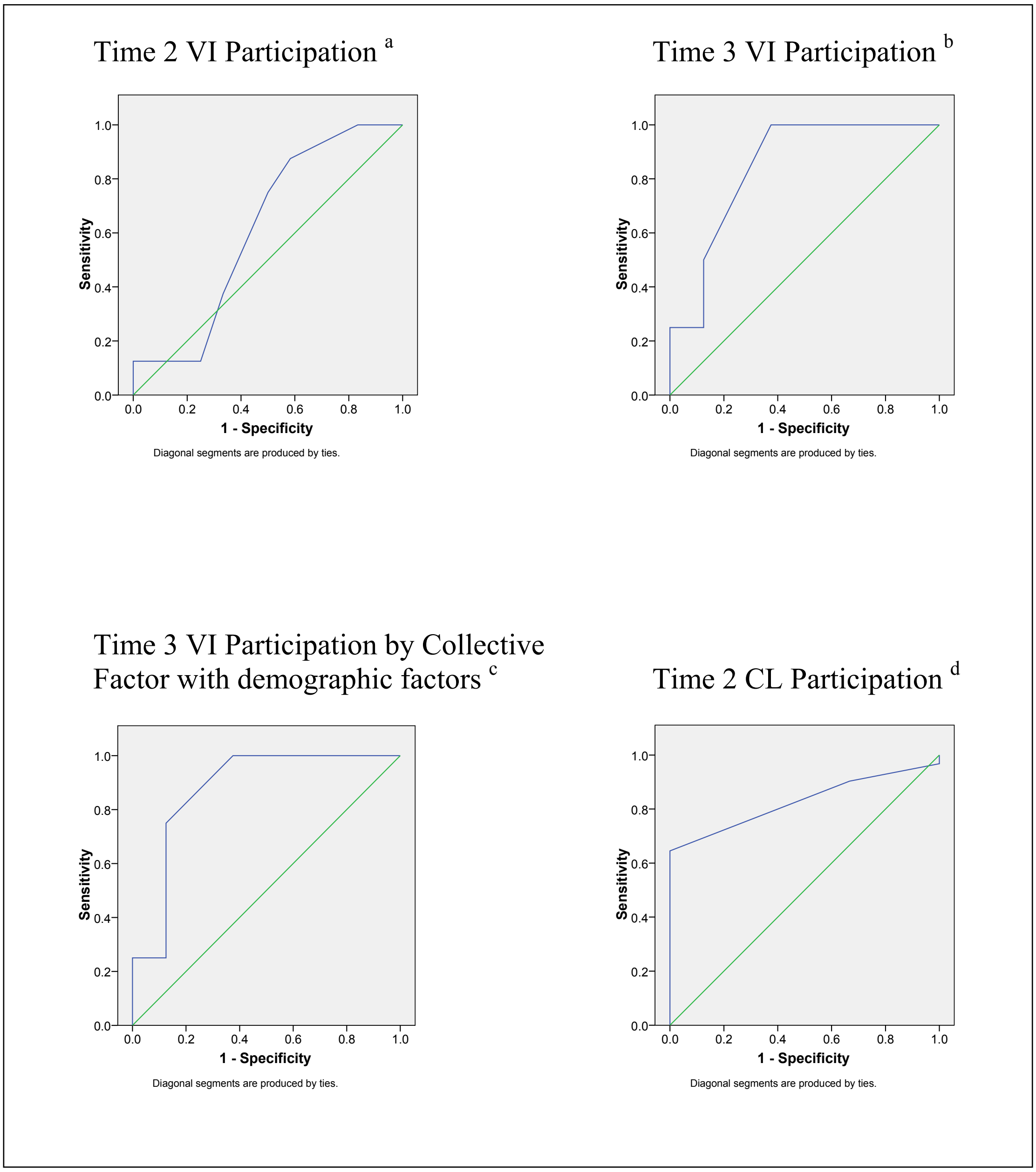


Figure 5.24. ROC Curve of Participation Index scores for Participation Success of children with (VI) and without vision impairment (CL) at Time 2 and 3

[a] Area under the ROC Curve .615, p = .396, 95% CI 0.364-0.865, positive (*good* Time 2 Participation) n = 8, negative (*poor* Time 2 Participation) n = 12**.**
[b] Area under the ROC Curve .844, Standard Error .115, p = .062, 95% CI 0.681-1.070, positive (*good* Time 3 Participation) n = 4, negative (*poor* T3 Participation) n = 8.
[c] Area under the ROC Curve .875, Standard Error .105, p = .042, 95% CI 0.669-1.081, positive (*good* Time 2 Participation) n = 4, negative (*poor* Time 2 Participation) n = 8.
[d] Area under the ROC Curve .828, Standard Error .081, p = .064, 95% CI 0.670-0.986, positive (*good* Time 3 Participation) n = 31, negative (*poor* T3 Participation) n = 3.

Table 5.15. Participation success of children with vision impairment and classmates by Participation Index score and time period

Participation Index score [a]	Time 2 Participation % (*n*)		Time 3 Participation % (*n*)	
	Poor	*Good*	*Poor*	*Good*
Children with vision impairment				
0	100 (1)	0 (0)	100 (1)	0 (0)
1	100 (1)	0 (0)	100 (1)	0 (0)
2	75 (3)	25 (1)	100 (3)	0 (0)
3	50 (1)	50 (1)		
4	40 (2)	60 (3)	50 (2)	50 (2)
5	33 (1)	67 (2)	0 (0)	100 (1)
6	100 (3)	0 (0)	100 (1)	0 (0)
7				
8	0 (0)	100 (1)	0 (0)	100 (1)
Total	60 (12)	40 (8)	66.7 (8)	33.3 (4)
Classmates				
0			0 (0)	100 (1)
1	0 (0)	100 (1)		
2	33.3 (1)	66.7 (2)	0 (0)	100 (4)
3	20 (1)	80 (4)	0 (0)	100 (3)
4	20 (1)	80 (4)	0 (0)	100 (2)
5	0 (0)	100 (2)	0 (0)	100 (5)
6	0 (0)	100 (7)	0 (0)	100 (1)
7	0 (0)	100 (1)	0 (0)	100 (5)
8	0 (0)	100 (10)		
Total	8.8 (3)	91.2 (31)	0 (0)	100 (21)

[a] Number of significantly influential individual factors that were present at Time 1.

Table 5.16. Participation success of children with vision impairment and classmates by Participation Index (including demographic factors) score and time period

Participation Index (with demographic factors) score[a]	Time 2 Participation % (*n*)		Time 3 Participation % (*n*)	
	Poor	*Good*	*Poor*	*Good*
Children with vision impairment				
0	100 (1)	0 (0)	100 (1)	0 (0)
1	100 (1)	0 (0)	100 (1)	0 (0)
2	66.7 (2)	33.3 (1)	100 (3)	0 (0)
3	100 (1)	0 (0)		
4	50 (1)	50 (1)		
5	33.3 (1)	66.7 (2)	66.7 (2)	33.3 (1)
6	60 (3)	40 (2)	0 (0)	100 (2)
7	66.7 (2)	33.3 (1)	100 (1)	0 (0)
8				
9	0 (0)	100 (1)	0 (0)	100 (1)
Total	60 (12)	40 (8)	66.7 (8)	33.3 (4)
Classmates				
2	0 (0)	100 (1)	0 (0)	100 (1)
3	25 (1)	75 (3)		
4	20 (1)	80 (4)	0 (0)	100 (5)
5	25 (1)	75 (3)	0 (0)	100 (2)
6	0 (0)	100 (1)	0 (0)	100 (1)
7	0 (0)	100 (8)	0 (0)	100 (6)
8	0 (0)	100 (2)	0 (0)	100 (2)
9	0 (0)	100 (9)	0 (0)	100 (4)
Total	8.8 (3)	91.2 (31)	0 (0)	100 (21)

[a] Number of significantly influential individual factors that were present at Time 1.

Table 5.17. Coordinates of the Curve, Participation Index (with demographics) for Time 3 Participation of children with vision impairment

Participation Index (with demographic factors) score [a]	Sensitivity	1 - Specificity
-1	1.000	1.000
1	1.000	0.875
2	1.000	0.750
4	1.000	0.375
6	0.750	0.125
7	0.250	0.125
8	0.250	0.000
10	0.000	0.000

Note. Participation Index (with demographics) has at least one tie between the positive and negative actual state group. The smallest cut-off value is the minimum observed test value minus 1, and the largest cut-off value is the maximum observed test value plus 1. All the other cut-off values are the averages of two consecutive ordered observed test values.
[a] Coordinate for a positive actual state (*good* Time 3 Participation) based on an equal or greater Participation Index score

5.9.2 Engagement Success

The Engagement Index was comprised of *good* (1) social skills, (2) individualisation, (3) teacher training and experience, (4) teacher attitude, (5) vision aides and equipment, (6) physical environment, (7) adult involvement, *poor* (8) staff support and (9) parent involvement, and *less* (10) early intervention. Another separate Engagement Index was constructed with demographic variables also, which consisted of *more* (11) severe vision impairment and (12) socio-economic status, and less (13) co-existing disability status.

The Engagement Index had differential impact on the engagement of children with vision impairment one and two years later. The Engagement Index did not accurately predict successful engagement within one year (Figure 5.25). The raw data do, however indicate some weak trends (Table 5.18); children with vision impairment with an Engagement Index score of less than 3 had unsuccessful engagement at the end of the first year. The remainder experienced a 50 to 80% success rate.

In contrast, the Engagement Index predicted successful engagement of children with vision impairment two years later with *good* accuracy (AUC = .889, $p < .05$) (Figure 5.25). An Engagement Index cut-off score of 6 provided moderate sensitivity (.667) and high specificity (1.00) (Table 5.19). While *all* children with vision impairment with *poor* Time 3 engagement had an Engagement Index score of less than 6; two thirds of children who experienced *good* engagement at Time 3 scored 6 or more. The raw data support these findings. The inclusion of demographic factors did not significantly alter any findings.

The Engagement Index did not significantly predict successful engagement of classmates over one or two years (Figure 5.25). The Time 3 ROC Curve analysis could not be performed due to 100% classmate success rate. The raw data did not reflect any relationship between Engagement Index score and classmate engagement level. Most classmates demonstrated successful engagement at Time 2 (94.1%) and Time 3 (100%) despite their Engagement Index score at the start of the first year.

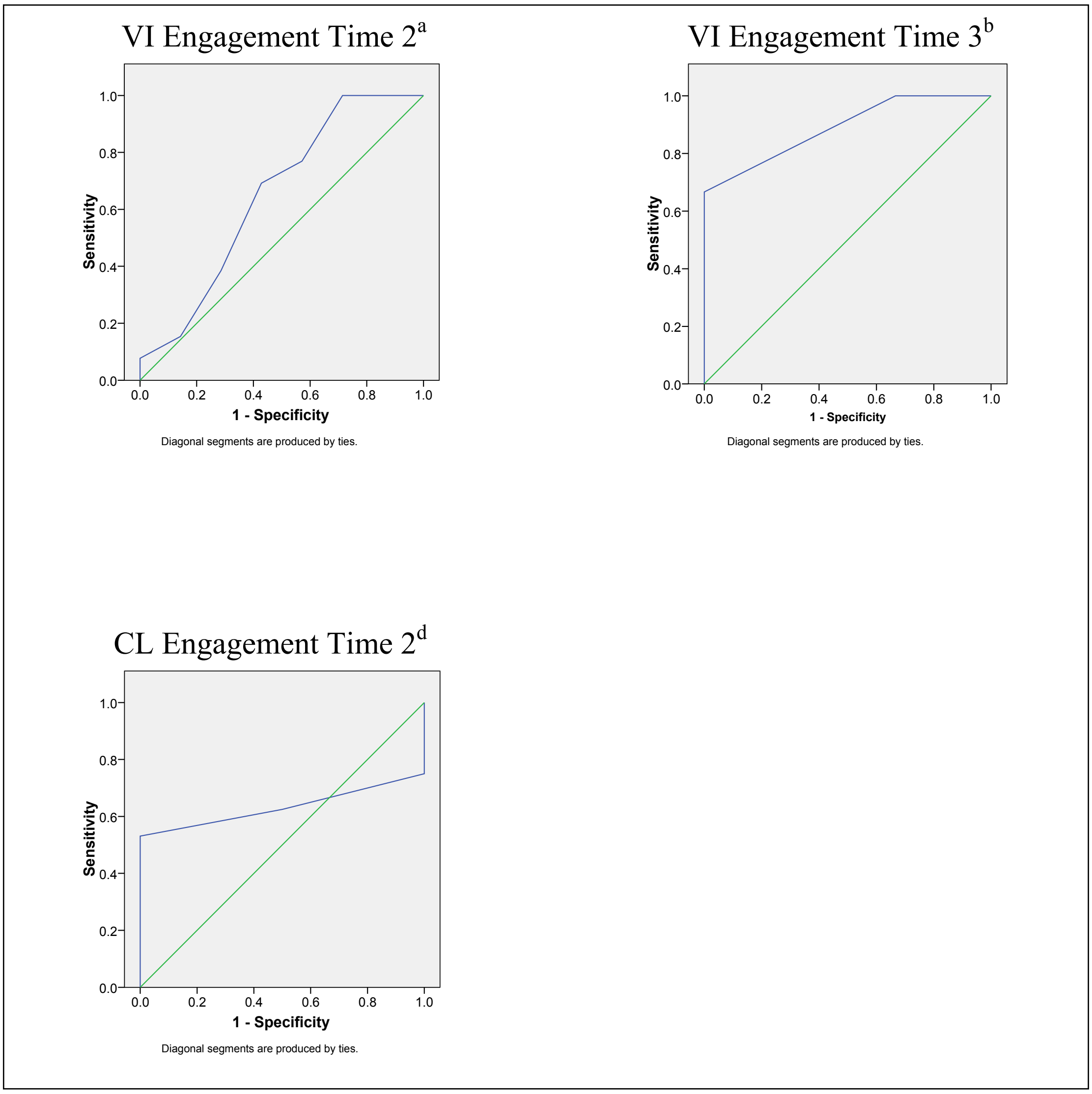


Figure 5.25. ROC Curve of Engagement Index scores for the Engagement Success of children with (VI) and without vision impairment (CL) at Time 2 and 3

[a] Area under the ROC Curve .648, Standard Error .141, p = .285, 95% CI 0.373-0.924, positive (*good* Time 2 Engagement) n = 13, negative (*poor* T2 Engagement) n = 7.

[b] Area under the ROC Curve .889, Standard Error .098, p = .025, 95% CI 0.697-1.081, positive (*good* Time 3 Engagement) n = 6, negative (*poor* T3 Engagement) n = 6.

[c] Area under the ROC Curve .633, Standard Error .093, p = .534, 95% CI 0.451-0.815, positive (*good* Time 2 Engagement) n = 32, negative (*poor* Time 2 Engagement) n = 2.

Table 5.18. Engagement success of children with vision impairment and classmates by Engagement Index and time period

Engagement Index score [a]	Time 2 Engagement % (*n*)		Time 3 Engagement % (*n*)	
	Poor	*Good*	*Poor*	*Good*
	Children with vision impairment			
1	100 (2)	0 (0)	100 (2)	0 (0)
2				
3	25 (1)	75 (3)	66.7 (2)	33.3 (1)
4	50 (1)	50 (1)		
5	20 (1)	80 (4)	66.7 (2)	33.3 (1)
6	25 (1)	75 (3)	0 (0)	100 (2)
7				
8	50 (1)	50 (1)	0 (0)	100 (1)
9	0 (0)	100 (1)	0 (0)	100 (1)
Total	35 (7)	65 (13)	50 (6)	50 (6)
	Classmates			
2	0 (0)	100 (1)	0 (0)	100 (1)
3	0 (0)	100 (7)	0 (0)	100 (3)
4	20 (1)	80 (4)	0 (0)	100 (4)
5	25 (1)	75 (3)	0 (0)	100 (3)
6	0 (0)	100 (4)	0 (0)	100 (4)
7	0 (0)	100 (8)	0 (0)	100 (1)
8	0 (0)	100 (5)	0 (0)	100 (5)
Total	5.9 (2)	94.1 (32)	0 (0)	100 (21)

[a] Number of individual predictors that were present at Time 1.

Table 5.19. Coordinates of the Curve, Engagement Index for Time 3 Engagement of children with vision impairment

Positive if Engagement Index score is greater than or equal to [a]	Sensitivity	1 - Specificity
0	1.000	1.000
2	1.000	.667
4	.833	.333
6	.667	.000
7	.333	.000
9	.167	.000
10	.000	.000

Note. The test result variable(s): Engagement Index has at least one tie between the positive actual state group and the negative actual state group.
The smallest cut-off value is the minimum observed test value minus 1, and the largest cut-off value is the maximum observed test value plus 1. All the other cut-off values are the averages of two consecutive ordered observed test values.
[a] Coordinates for a positive actual state (*good* Time 3 Engagement) based on an equal or greater Engagement Index score

5.9.3 Child Interaction Success

The Child Interaction Index was comprised of: *good* (1) social skills, (2) teacher training and experience, (3) teacher attitude and (4) adult involvement. The Child Interaction Index with demographic factors also included *more* (5) socio-economic status and *less* (6) co-existing disabilities.

The Child Interaction Index predicted the child interaction success of children with vision impairment over both one and two years (Figure 5.26). The Index predicted with *good* accuracy (AUC = .894) over one year and *excellent* accuracy (AUC = .953) two years later. Within one year, a Child Interaction Index cut-off score of 3 differentiated between successful and unsuccessful child interaction, with moderate sensitivity (0.636) and good specificity (0.889) (Table 5.20). Almost two thirds of children with vision impairment with *good* Child Interaction at Time 2 had a Child Interaction Index score of at least 3; whilst most (88.9%) children with vision impairment with *poor* Time 2 interaction scored less than 3.

Only two factors were required to predict successful interaction of children with vision impairment two years later. A Child Interaction Index score of 2 resulted in excellent sensitivity (87.5%) and specificity (100%) (Table 5.21): 87.5% of children with vision impairment with *good* interaction at Time 3 had a Child Interaction Index score of 2 or more, and all children with vision impairment who were unsuccessful in interaction had an Index score below 2. The raw data illustrates these strong trends; the proportion of successful children with vision impairment steadily increased as the Child Interaction Index score did (Table 5.22).

While the Child Interaction Index predicted the success of children with vision impairment, it did not significantly predict classmate interaction over one or two years (Figure 5.26). The raw data confirm that there were no trends: most classmates demonstrated successful interaction despite their Child Interaction Index score. Furthermore, some of the classmates demonstrated *poor* child interaction levels at Time 2 and 3 although having high (3-4) Child Interaction Index scores (Table 5.22).

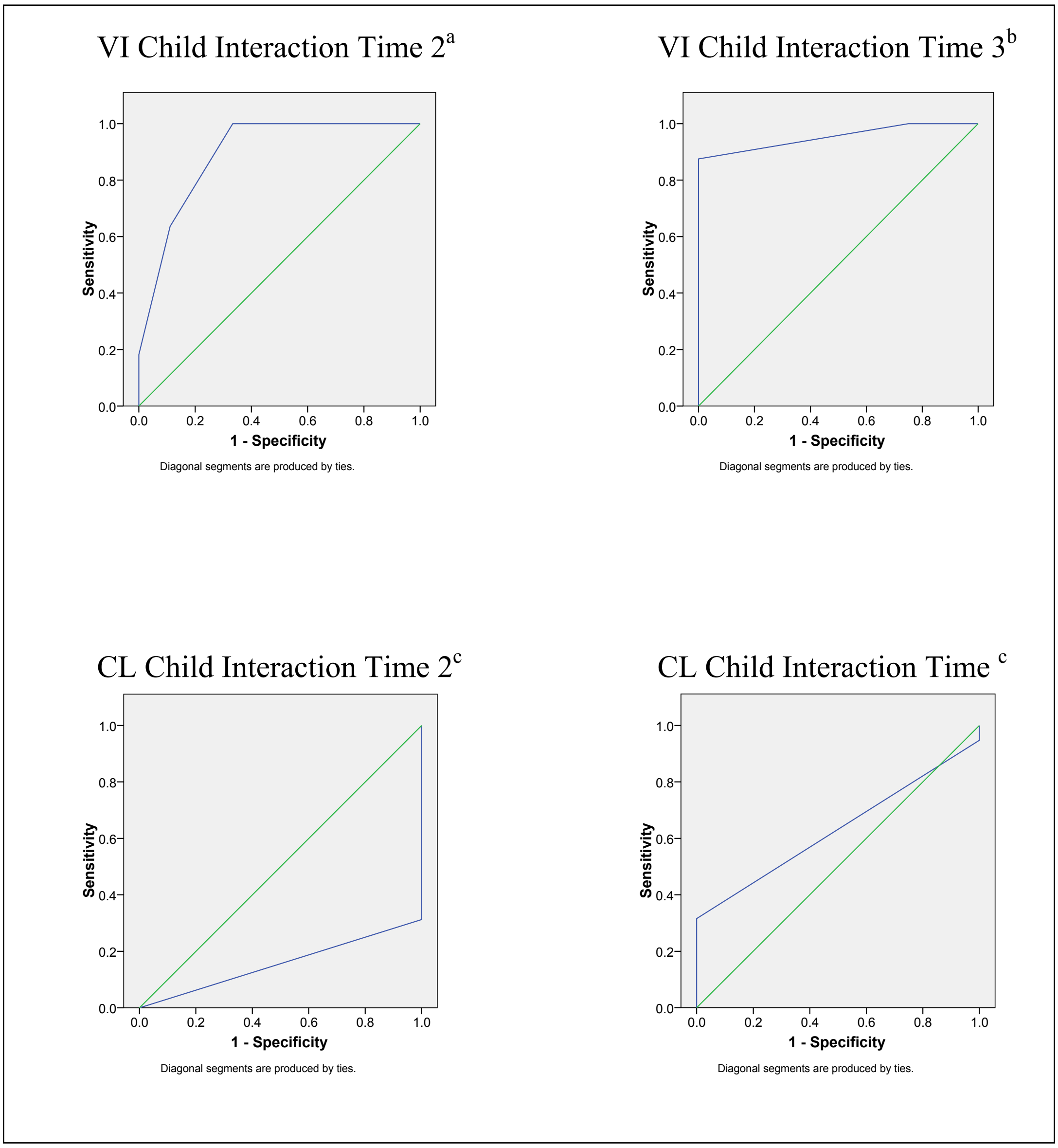


Figure 5.26. ROC Curve of Child Interaction Index scores for child interaction success of children with vision impairment (VI) and classmates (CL) at Time 2 and 3

[a] Area under the ROC Curve .894, Standard Error .076, p = .003, 95% CI 0.745-1.042, *good* Time 2 Child Interaction n = 11, (*poor* Time 2 Child Interaction n = 9.
[b] Area under the ROC Curve .953, Standard Error .061, p = .014, 95% CI 0.833-1.073, *good* Time 3 Child Interaction n = 8, *poor* Time 3 Child Interaction n = 4.
[c] Area under the ROC Curve .156, Standard Error .110, p = .248, 95% CI -0.058- 0.371, *good* Time 2 Child Interaction n = 32, *poor* Time 2 Child Interaction n = 1.
[d] Area under the ROC Curve .632, Standard Error .159, p = .549, 95% CI 0.320-0.943. *good* Time 3 Child Interaction n = 19, *poor* Time 3 Child Interaction n = 2.

Table 5.20. Coordinates of the Curve, Child Interaction Index for Time 2 child interaction success of children with vision impairment

Child Interaction Index score [a]	Sensitivity	1 - Specificity
-1	1.000	1.000
1	1.000	.778
2	1.000	.333
3	.636	.111
4	.182	.000
5	.000	.000

Note. Child Interaction Index has at least one tie between the positive actual state group and the negative actual state group. The smallest cut-off value is the minimum observed test value minus 1, and the largest cut-off value is the maximum observed test value plus 1. All the other cut-off values are the averages of two consecutive ordered observed test values.
[a] Coordinates for a positive actual state (*good* Time 2 Child Interaction) based on an equal or greater Child Interaction Index score.

Table 5.21. Coordinates of the Curve, Child Interaction Index for Time 3 child interaction success of children with vision impairment

Positive if Child Interaction Index score is greater than or equal to [a]	Sensitivity	1 - Specificity
-1	1.000	1.000
1	1.000	.750
2	.875	.000
3	.625	.000
4	.250	.000
5	.000	.000

Note. Child Interaction Index has at least one tie between the positive actual state group and the negative actual state group. The smallest cut-off value is the minimum observed test value minus 1, and the largest cut-off value is the maximum observed test value plus 1. All the other cut-off values are the averages of two consecutive ordered observed test values.
[a] Coordinates for a positive actual state (*good* Time 3 Child Interaction) based on an equal or greater Child Interaction Index score.

Table 5.22. Child interaction success of children with vision impairment and classmates by Child Interaction Index and time period

Child Interaction Index score [a]	Time 2 Child Interaction % (*n*)		Time 3 Child Interaction % (*n*)	
	Poor	*Good*	*Poor*	*Good*
Children with vision impairment				
0	100 (2)	0 (0)	100 (1)	0 (0)
1	100 (4)	0 (0)	75 (3)	25 (1)
2	33.3 (2)	66.7 (4)	0 (0)	100 (2)
3	16.7 (1)	83.3 (5)	0 (0)	100 (3)
4	0 (0)	100 (2)	0 (0)	100 (2)
Total	45 (9)	55 (11)	33.3 (4)	66.7 (8)
Classmates				
1	0 (0)	100 (3)	0 (0)	100 (1)
2	0 (0)	100 (10)	14.3 (1)	85.7 (6)
3	0 (0)	100 (9)	14.3 (1)	85.7 (6)
4	9.1 (1)	90.9 (10)	0 (0)	100 (6)
Total	3 (1)	97 (32)	9.5 (2)	90.5 (19)

[a] Number of individual predictors that were present at Time 1.

5.9.4 Academic Success

The Academic Index was comprised of *good* (1) physical environment, (2) adult involvement, (3) teacher training, (4) parent involvement, (5) teacher attitude, (6) social skills, and (7) vision aides and equipment; *poor* (8) school attitude; and *less* (9) early intervention. The Academic Index with demographic variables also consisted of *less* (10) severity of vision impairment, (11) co-existing disabilities and *more* (12) socio-economic status.

The Academic Index predicted the academic success of children with vision impairment over one year with excellent accuracy (AUC = .943, $p < .05$) (Figure 5.27). An Academic Index score of 5 provided high sensitivity (.833) and specificity (.875) (Table 5.23). The majority of children with vision impairment (83.3%) who attained good academic levels at Time 2 had an Academic Index score of at least 5. In contrast, most (87.5%) children with *poor* academic outcomes scored less than 5. Raw data also supports these trends (Table 5.24).

Though the Academic Index predicted academic success within one year, it did not predict the academic success of children with vision impairment two years later ($p > .05$). The raw data suggest that a weak trend may exist; all children with vision impairment with an Academic Index score of 6 or more attained academic success two years later (Table 5.24).

The Academic Index did not predict the interaction of classmates within one year or over two years ($p > .05$) (Figure 5.27). As the frequency table indicates, while a weak trend may exist, most classmates demonstrated successful academic performance at Time 2 (88.2%) and Time 3 (90.5%) (Table 5.24).

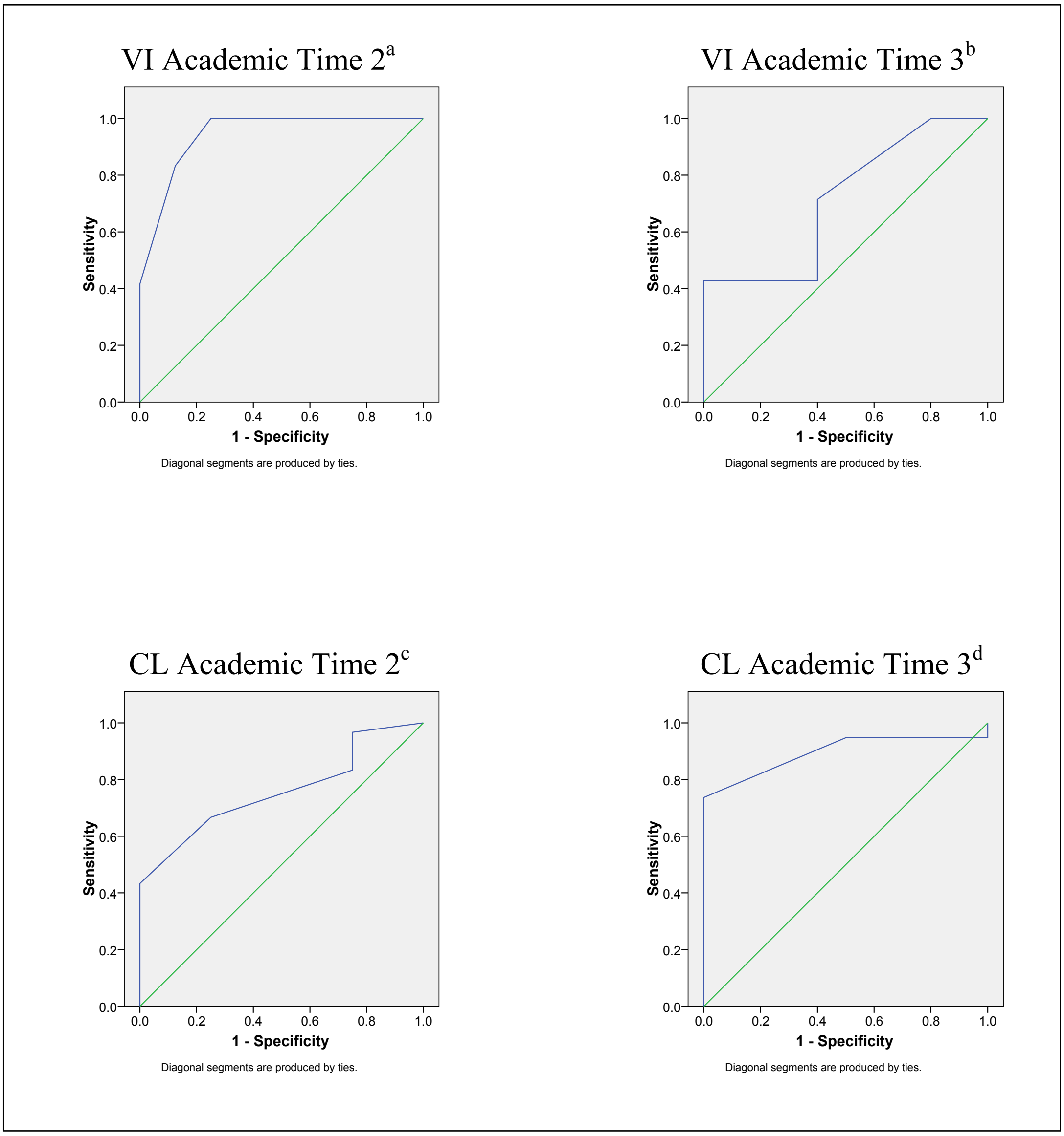


Figure 5.27. ROC Curve of Academic Index scores for Academic Success of children with (VI) and without vision impairment (CL) at Time 2 and 3

[a] Area under the ROC Curve .943, Standard Error .054, p = .001, 95% CI 0.837-1.048, positive (*good* Time 2 Academic Competence) n = 12, negative (*poor* Time 2 Academic Competence) n = 8.
[b] Area under the ROC Curve .714, Standard Error .155, p = .233, 95% CI 0.410-1.019, positive (*good* Time 3 Academic Competence) n = 7, negative (*poor* Time 3 Academic Competence) n = 5.
[c] Area under the ROC Curve .758, Standard Error .100, p = .098, 95% CI 0.562-.955, positive (*good* Time 2 Academic Competence) n = 30, negative (*poor* Time 2 Academic Competence) n = 4.
[d] Area under the ROC Curve .895, Standard Error .079, p = .072, 95% CI 0.740-1.049, positive (*good* Time 3 Academic Competence) n = 19, negative (*poor* Time 3 Academic Competence) n = 2.

Table 5.23. Coordinates of the Curve, Academic Index for Time 2 academic success of children with vision impairment

Academic Index score [a]	Sensitivity	1 - Specificity
0	1.000	1.000
2	1.000	.875
3	1.000	.750
4	1.000	.250
5	.833	.125
6	.417	.000
7	.250	.000
8	.000	.000

Academic Index has at least one tie between the positive actual state group and the negative actual state group.
The smallest cut-off value is the minimum observed test value minus 1, and the largest cut-off value is the maximum observed test value plus 1. All the other cut-off values are the averages of two consecutive ordered observed test values.
[a] Coordinates for a positive actual state (*good* Time 2 Academic Competence) based on an equal or greater Academic Index score.

Table 5.24. Academic success of children with vision impairment and classmates by Academic Index and time period

Academic Index score [a]	Time 2 Academic success % (n)		Time 3 Academic success % (n)	
	Poor	*Good*	*Poor*	*Good*
Children with vision impairment				
1	100 (1)	0 (0)	100 (1)	0 (0)
2	100 (1)	0 (0)		
3	100 (4)	0 (0)	50 (2)	50 (2)
4	33.3 (1)	66.7 (2)	0 (0)	100 (2)
5	16.7 (1)	83.3 (5)	100 (2)	0 (0)
6	0 (0)	100 (2)	0 (0)	100 (1)
7	0 (0)	100 (3)	0 (0)	100 (2)
8				
Total	40 (8)	60 (12)	41.7 (5)	58.3 (7)
Classmates				
2	50 (1)	50 (1)	0 (0)	100 (1)
3	0 (0)	100 (4)	100 (1)	0 (0)
4	28.6 (2)	71.4 (5)	20 (1)	80 (4)
5	12.5 (1)	87.5 (7)	0 (0)	100 (6)
6	0 (0)	100 (8)	0 (0)	100 (3)
7	0 (0)	100 (4)	0 (0)	100 (4)
8	0 (0)	100 (1)	0 (0)	100 (1)
Total	11.8 (4)	88.2 (30)	9.5 (2)	90.5 (19)

[a] Number of individual predictors that were present at Time 1.

5.9.5 Summary

Each of the outcome Indices successfully predicted successful outcomes either one and/or two years later (Table 5.25). The Participation and Engagement Indices did not predict successful outcomes within one year, but they were able to predict success two years later. For both, an Index score of 6 differentiated between successful and unsuccessful performance. One of these was required to be a demographic factor to predict Participation. The Child Interaction Index predicted successful child interaction both one and two years later, with respective scores of 3 and 2 required. The Academic Index was different. The Academic Index predicted academic success within one year, but not two years later. The Index cut-off score was 5. Conversely, the Indices did not predict classmate outcomes at all.

Table 5.25. Ability of Indices to predict successful outcomes one and two years later

Index	Index predicts successful outcomes of children with vision impairment? (Index score)	
	One year later	Two years later
Participation Index	No	Yes (6)
Engagement Index	No	Yes (6)
Child Interaction Index	Yes (3)	Yes (2)
Academic Index	Yes (5)	No

5.10 CONCLUSION

The inclusive outcomes of children with vision impairment were significantly poorer than those of classmates. However, the results demonstrate that these inclusive outcomes can be influenced. More-so, combinations of stakeholder factors were able to predict successful outcomes up to two years later. Between two to six factors were required to increase the likelihood of successful inclusive outcomes. The adequacy of the situation in which children with vision impairment were educated varied significantly among schools. Some schools have inadequate Environmental features, and some children experience poor Activity and Personal contexts. These major findings will now be discussed in chapter 6. Following the discussion, recommendations (mindful of the limitations of the study) are made in chapter 7.

CHAPTER 6

DISCUSSION

6.1 INTRODUCTION

The findings of Phase 2 confirmed four main issues: (1) while some children with vision impairment currently experience inclusion; (2) the inclusive outcomes of children with vision impairment are significantly poorer than their peers. This confirms that a major problem exists in the early education of some children with vision impairment. (3) Fortunately, the inclusive outcomes of children with vision impairment can be influenced up to two years later by a combination of specific factors. There were common factors that had a pervasive impact on all inclusive outcomes. It is possible that these factors may have an even longer term effect. (4) Presently, some children with vision impairment are exposed to less than adequate situations in regular early education. These situations (i.e. the stakeholder factors) need to be improved in order to promote the inclusion of these students.

This chapter discusses these major findings in relation to previous knowledge. Explanations are provided for the findings by relating the results to the wider education context. Some correlations presented in this chapter were not part of the main aims or analysis. However, in order to justify and comprehensively explore the results of the study, relationships between stakeholder and demographic factors were determined and discussed in this chapter. Statistics are provided in Appendix W.

6.2 INCLUSIVE OUTCOMES

This section compares the inclusive outcomes found in this study with inclusion theory and previous research. The change in inclusive outcomes over time is examined and justification is sought for differences between groups.

6.2.1 Level of Inclusion Experienced by Children with Vision Impairment

There has been a dedicated push for inclusive education in Australia during the last decade. This has seen change in legislation, policy, restructuring of physical infrastructure, human resources, and service delivery. There has been substantial effort put into the reform of educational services. The results of this study indicate that inclusion *can* and currently *does* exist for some children with vision impairment. Up to 35% of children with vision impairment attained success in all four outcome areas during the two years. This supports previous anecdotal evidence (Palmer, 2000b). However, the study also exposed serious flaws in the apparent 'inclusion' of many children with vision impairment. The lack of inclusive outcomes observed for many of these children contradicts the very premise of inclusion. Rather than being a part of all aspects of the class, children with vision impairment consistently participated in fewer class activities, were less engaged, and had poorer interaction than their classmates did. This resembles integration more so than inclusion; where children with disabilities are placed in a regular class, but have limited interaction with peers or in class proceedings (Elkins, 2002; D. Power & Hyde, 2002; Wills & Jackson, 1996). The findings also give weight to stakeholder concerns about the inadequate social and curricular inclusion of children with disabilities in Australian schools (Loreman & Deppeler, 2000; Seymour, 2000; Wills & Jackson, 2000b). The limited participation, engagement and interaction suggest that there is a distinct lack of equality and appropriate access in early education classes. Children with vision impairment were more likely than classmates to experience *poor* overall outcomes. These poor early experiences may place these children at risk of future academic (Greenwood, 1991; Ladd et al., 1997; Vitaro et al., 1992), social (R. O'Neil et al., 1997) and emotional difficulties (De Rosier et al., 1994; Simeonsson et al., 2001). There is a critical need for continued reform of educational services to improve the inclusive experience for children with vision impairment.

The inclusive outcomes experienced by children with vision impairment in this study are supported by findings in previous research. Firstly, the social interaction experienced by children with vision impairment has also been reported in previous research. Children with vision impairment had poorer child interaction than classmates (as measured by the QuIEM). This comprised of: (a) frequency, (b) the nature, and (c) initiation of interactions, as well as the (d) reciprocation of interactions by the observed child and (e) others. Research over time has consistently reported difficulties in these social areas for children with vision impairment: reduced frequency of interaction (Crocker & Orr, 1996; McGaha & Farran, 2001; Troster & Brambring, 1994); reduced reciprocation of interactions by children with vision impairment (Celeste, 2006; Kekelis, 1992b; Taylor-Hershel & Webster, 1983); reduced peer reciprocation towards these children (Erwin et al., 1999); and difficulties initiating interaction (McGaha & Farran, 2001). Poor levels of social interaction are all too common for children with vision impairment in regular early education. Dedicated strategies must be put in place to address this.

Secondly, the academic scores reported in this study are supported by previous research. In particular, the SSRS ratings of children with vision impairment are similar to those reported among children in the US who were blind, attending grades 1 to 5 (Buhrow et al., 1998). The children in the US study were older and had fewer co-existing disabilities to those in the present study. Their mean standard SSRS academic scores (M = 92.2, SD = 10.3, n = 23) were only slightly higher than those attained by the Australian children academic scores at Time 1 (M = 91, SD = 13.9, n = 18); Time 2 (M = 90, SD = 14.7, n = 19); and Time 3 (M = 90.6, SD = 11.9, n = 12). This provides verification for the results of this study.

Previous studies have not measured the typical engagement or participation experienced by children with vision impairment in early or primary education. This study provides new information about these two critical, curricular components of inclusion. Essentially, children with vision impairment were not being included adequately in the curriculum. They were commonly disengaged or participating in a separate activity. This study is supported by preliminary observations that noted limited participation (Leiberman et al., 2006; Simeonsson et al., 2001) and engagement among children with vision impairment in regular education (Kekelis, 1992b; Tait & Wolfgang, 1984; Taylor-Hershel & Webster, 1983). The level of engagement observed in this study (50 - 65% of the time) was also similar to the levels of engagement of children with mild to severe disabilities (55 - 60% of the time) (Odom & Buysse, 2005). Other qualitative research has demonstrated best practice examples of how children with vision impairment can appropriately participate in class activities (Davis & Hopwood, 2002a). There is a need to improve children's curricular inclusion in regular classes to meet these best practice standards for all.

The issue of participation deems further discussion. In most cases, classmates in this study participated in most classroom activities. However children with vision impairment often did not participate in activities with other children. Observation field notes indicate that when they were not participating they were either: (a) alone or with a staff member only during social, play and/or recess times; (b) involved in a separate, teacher-assigned activity; (c) involved in a separate activity with an education assistant or specialist in the class; or (d) withdrawn from the class for an individualised session with a therapist, visiting teacher or education assistant. The separate sessions with classroom staff and specialists were generally targeting individual objectives or Expanded Curriculum skills. Indeed, these add extra dimensions to the instruction and learning that the child needs. In the classroom, both teachers and education assistant can use differentiation strategies to address individual objectives within a lesson (Rief & Heimburge, 2006). This overcomes the need to assign the child to a separate activity.

Withdrawal or specialised activities is a common strategy used by therapists and teachers to target these additional needs (Lindsay, Dockrell, Mackie, & Letchford, 2005). There are pros and cons to withdrawal. The separate environment promotes focused attention on individual objectives, management of behaviour issues, and can be the most appropriate place to target personal issues that would not be appropriate to do in front of classmates (e.g. self care) (Davis & Hopwood, 2002a; Gartland, 2001). However, the withdrawal of children from class activities has the potential to isolate students from their peers and further highlight differences. Removal from the class can disrupt learning in other curricular areas or practical sessions (Beveridge, 1999). Working on a separate activity in the class can pose the same issues as withdrawal. The literature suggests that if withdrawal is used, it should be coupled with consultation with the classroom teacher, to ensure generalisation of skills to the classroom situation (Gartland, 2001).

While some specialists in this study were observed to withdraw students with vision impairment by themselves, not all did. Some invited a well-liked classmate to join the child with vision impairment at the session; and others integrated individualised instruction into the context of the classroom lesson. This integrated, in-class approach is recommended in the literature (Case-Smith, Rogers, & Johnson, 2001;

Davis & Hopwood, 2002b). Using this model, therapy or specialist teaching takes place in the students' environment and focuses on priority activities. In doing so, specialists need to offer interventions that fit the classroom structure, culture, teaching methods and timetable. Sessions can be scheduled so that the class timetable coincides with targeted goal areas. Negotiation is required between specialists and teachers alike.

The Response to Instruction movement in the US provides some direction for addressing this problem. This acknowledges the continuum of instructional supports and focuses on an approach where support for learning is provided on need rather than eligibility to specialised support merely due to the existence of a disability. It recommends three intensities of instruction based on systematic screening throughout general education (Grimes & Kurns, 2003). "Primary prevention" of academic or behavioural failure is implemented as the first option. This comprises of school or classroom wide systems for all students, implemented by all staff. "Secondary prevention" consists of specialised group systems for students at-risk of academic or behaviour failure; and "tertiary prevention" (specialised individualised systems) is implemented for only students at high risk of failure.

6.2.2 Investigation of Outcomes over Time

A novel aspect of this study was the measure of outcomes over time. For three of the outcomes, the difference between children with and without vision impairment remained stable throughout the two years. Consistently, children with vision impairment had lower participation, engagement and child interaction scores than classmates. However, the academic performance of children with and without vision impairment differed over time. The academic ratings of children with vision impairment were not significantly different to classmates in the first year. At the end of the second year the gap widened, and children with vision impairment had significantly poorer performance. The same trend existed for social skills. This variation between children with and without vision impairment has not been studied, nor reported before. Previous research has not measured academic performance over time.

The trends may be explained by one of three arguments. Firstly, the increasing complexity of the curriculum may account for the change in academic performance over time. It is likely that children with vision impairment are able to adequately access and meet the learning objectives of earlier grades. In later grades, students may face greater challenges as the learning materials become more complex (more visually presented) and the pace of learning increases. Academic differences may emerge as children with vision impairment experience restricted access to learning opportunities while classmates continue to access these opportunities. The US data add weight to this argument. The cross-sectional US study reported that the academic scores of the participants were significantly lower than SSRS norms [$t(1040) = 2.36$, $p < .05$] (Buhrow et al., 1998). Since the US children were in higher grades (1 - 5), this may support the premise that children with vision impairment increasingly experience difficulties accessing the curriculum and performing at grade level as they progress through school. Other research however, has reported mixed findings, which may or may not be related to grade level (Ek et al., 2003; Fellenius, 1996; Wall & Corn, 2004).

Secondly, the differences over time may be explained by teacher expectations. In this study, there were some differences found in teacher attitude. In particular, the attitude of teachers with students who are vision impaired in the first year differed to those in the second year. The teachers in the second year were more positive towards inclusion. It is plausible that teachers in the second year with more positive attitudes held stronger ideals of equality among students; thus had higher expectations of children with vision impairment, and rated them more realistically (Cook, 2004). On the other hand, the attitude of classmate teachers was not different between years. This could explain why children with vision impairment had significantly lower academic scores than classmates in the second year only. It is also possible that teachers at entry level grades expect that students will commence school with a wide range of social and academic skills, given the developmental variance among younger children (Case-Smith, 2001). Hence what is considered ‘average’ may be defined broadly. By the second year, teacher may expect student performance to be more homogenous. As such, these teachers may have rated more children with vision impairment as having ‘below average’ skills. Increased teacher expectations of behaviour could also explain the unexpected drop in classmate engagement and child interaction noted in the second year.

Finally, changes in the stakeholder factors over the two years may have impacted on the academic performance of the students. Children with and without vision impairment experienced slightly different changes in their early education situation over time. For children with vision impairment, the physical environment and attitude of teachers changed over time. On the other hand, classmates experienced changes in adult and parent input. These differential changes may have had a mixed impact on the academic performance of the two groups of children.

Interestingly, the engagement of both children with and without vision impairment significantly increased during the first year. These improvements may reflect child development. It is likely that development in attention span and fundamental concepts throughout the year would lead to an increase in on-task and active engagement among children with and without vision impairment alike (Case-Smith, 2001). The changes may also reflect children's adjustment to early education. Initial observations were conducted nine weeks after the commencement of the school term, when it is likely that children were becoming acquainted with the learning environment. Over time, children may adapt to the expectations of school, including independent engagement in tasks. Throughout the year, students' adaptation to the class environment (e.g. class rules, orientation to the environment and people) may enable them to be more engaged in activities. It is plausible that transition pre-educational preparation (e.g. introduction to rules, learning expectations, scaffolded attention tasks) and/or transition planning (e.g. orientating children with the class, teacher and peers they will be attending school with) could introduce children to classroom expectations. This may well give children with vision impairment a critical advantage for their engagement in regular early education.

The group of children with vision impairment experienced poorer outcomes than classmates. These findings are supported by previous research. There was variance among the inclusion of children with vision impairment. This study has shown that the variance in their outcomes can be accounted for by the variance observed in the stakeholder factors. As such, the wide variance in outcomes of students with vision impairment should not and need not exist.

6.3 PREDICTING INCLUSIVE OUTCOMES

The following section examines the combination of factors that can predict the inclusion of children with vision impairment. It investigates the potential long term effects of these factors and considers a model of inclusion. The section then seeks to explain some of the unexpected results – particularly why some variables predicted success one year later and why others only predicted success two years later. Further, it also delves in to the number of factors required to increase the likelihood of successful inclusion. The inclusive outcomes of classmates are then discussed.

6.3.1 A Combination of Factors Predicts Inclusion

This study demonstrated that specific factors *are* able to mediate the inclusion of children with vision impairment up to two years later. Specifically, it found that a combination of factors, rather than one single factor, is required to predict successful inclusion. Seminary developmental research supports this premise. Population studies in Australia have confirmed that a combination of factors is able to protect children from risk factors (Rutter, 1985; Silburn et al., 1996). Qualitative vision impairment research has proposed models of inclusion, theorising the interactive nature of contextual factors and inclusion (George & Duquette, 2006; Kekelis & Sacks, 1988). This study has extended these models and empirically demonstrated that combinations of factors do have a measurable influence on inclusive outcomes. This information provides critical information to early interventionists and educators; the outcomes of children with vision impairment can be influenced by known factors. Children with vision impairment may be at risk of substandard inclusive outcomes if the necessary factors are not provided for them. It is more likely that a range of factors, rather than an isolated few, will promote success.

6.3.2 The Long Term Effects of Factors

The combinations of factors measured in this study had a strong and lingering impact on the success of children with vision impairment. Three of the outcome Indices predicted successful outcomes two years later. These findings are supported by the very principle of early intervention: early experiences affect development and performance, and the effects persist over time (Feldman, 2003; Guralnick, 1997). Substantive longitudinal evidence indicates that early educational experiences can affect social, academic and behavioural outcomes of typical children up to eight years later (Agostin & Bain, 1997; Ladd et al., 1997; R. O'Neil et al., 1997). It is also likely that such long term effects persist for children with vision impairment. While this study demonstrated that the Index factors experienced in early education influenced inclusive outcomes up to two years later, the effects may actually persist throughout primary school education, if not further.

A model of early educational experiences illustrates this argument (Figure 6.1). The model sits within existing early intervention theory (Feldman, 2003) and outlines the potential benefits and detriments of early educational experiences. It is likely that children who are exposed to enough factors at the start of their education will continue to experience successful outcomes in the future. Importantly, children who are exposed to an inadequate early education situation may be at risk of continued unsuccessful outcomes. It would be an overstatement to suggest that a child's early path of success is unchangeable. Certainly, it is likely that mediating experiences later in life are able to alter this path and facilitate successful inclusion. This is supported by the timely remediation of educational and developmental difficulties in the general student population (Ebbels, van der Lely, & Dockrell, 2007; Geiger & Lettvin, 1994). Such a window of opportunity may exist for the remediation of inclusive outcomes for children with vision impairment.

While these concepts were not tested in the present research, the conceptual model provides a framework for future research. It may guide further investigation of the long term effects of Index factors and experiences for effects of contextual factors for children with vision impairment. The model of early educational experiences is further supported by some unexpected results of this study. These require further consideration.

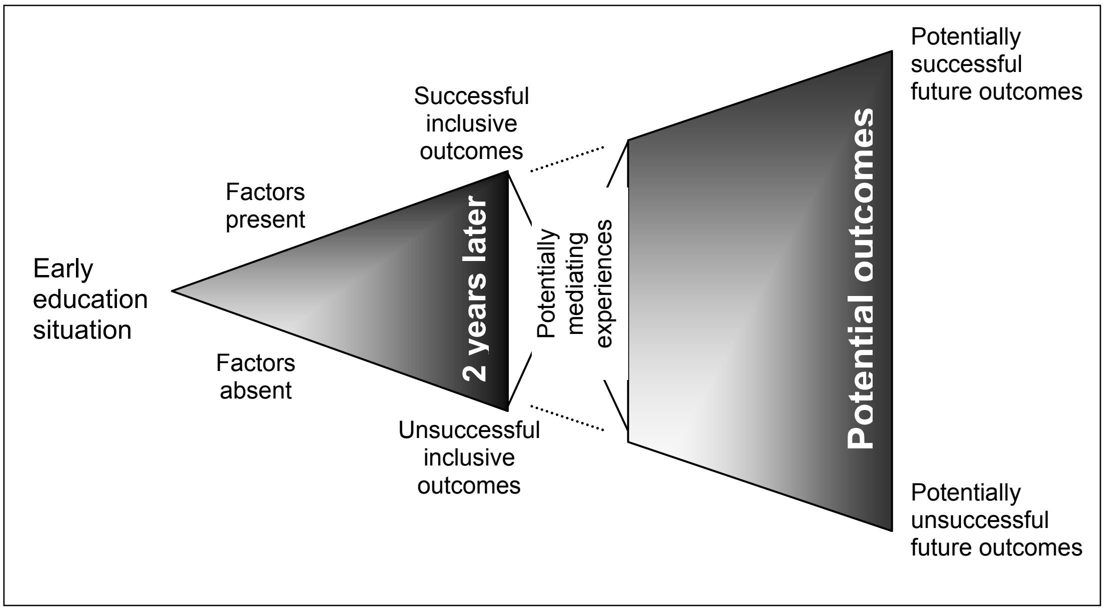


Figure 6.1. Model of early education experiences and potential future outcomes

6.3.3 Ability of Index Factors to Predict Success One and/or Two Years Later

It was originally thought that the stakeholder factors would exert a stronger influence over (a) outcomes in the same classroom rather than in a different classroom, and (b) outcomes that were temporally closer – that is, one year later than two years later. The sample size also strengthened this expectation. Since smaller samples are less likely to be good representations of population characteristics, actual differences between groups are less likely to be recognised (Portney & Watkins, 2000). It was expected that significant ROC findings would be found over one year (n = 20) rather than over two years (n = 13).

Interestingly, this expectation was realised for academic outcomes only, and did not apply to the other outcomes. The outcome Indices predicted participation and engagement two years later (in a different class), but not one year later (in the same class). The Child Interaction Index predicted success both one and two years later. These findings further highlight the pervasive impact that the stakeholder factors have upon most inclusive outcomes of children with vision impairment. Not only did they influence performance over time, but the stakeholder factors influenced children's experiences in a different classroom environment.

A statistical explanation was sought to justify the unexpected and mixed findings. Since categorical data were used, the cell count can give an indication of the ability to detect differences between groups. It would be more likely to detect a difference within a group with a reasonable sample size in each (cell count) rather than when there are very few participants in one category (e.g. when n = 10 *good* and n = 10 *poor* rather than n = 19 *good* and n = 1 *poor*) (Portney & Watkins, 2000). However, extreme cell counts were not noted in any of the outcome variables at Time 2 or Time 3. The findings are not merely statistical fluctuations.

Clinically, the explanation may be based in the characteristics of the outcomes that were investigated. Each of these outcomes is discussed in turn, and a rationale is provided to justify why it was able to be predicted over one and/or two years. The social interaction of children may be relatively responsive to Environmental and Activity factors. Indeed, evidence shows that intervention from adults such as behavioural techniques, cooperative learning and reinforcement) can be highly effective in increasing the interactive behaviours of sighted children and those with vision impairment (Erwin et al., 1999). The consistent influence of the Child Interaction Index on the interaction of children in this study supports this. Results suggest that child interaction can be modified by contextual factors. If the right combination of factors are in place at (or before) early education, it is highly likely that children will experience successful interaction. However, the likelihood of poor performance is also high if these requirements are not met.

Participation and Engagement Indices predicted successful outcomes two years later, but not within one year (also more individual factors significantly influenced outcomes two years later). As discussed with academic performance (see section 6.2.2), these results may reflect increased complexity of work in each grade. In the earlier grades, work may be more accessible to children with vision impairment (e.g. larger print, concrete learning activities) and it may be easier for educators to present content in a non-visual format. Even children experiencing poorer Index factors may be able to participate in class activities and maintain engagement. As work becomes more complex in the higher grades, this accessibility may reduce. In this study, a greater proportion of children experienced *good* participation and engagement at Time 2 than Time 3. It is probable that children who commenced their schooling with adequate factors (i.e. good social skills, had an adequate level of adult involvement and well trained teachers) developed skills to be more involved in the curriculum in the higher grades (i.e. they were adequately engaged in tasks). In turn, their new teachers in the subsequent grades may have perceived that these children were better able to be involved in the curriculum. As a result, they allocated them to class rather than specialised activities (i.e. increased participation). Early educational experiences may promote development; instil confidence or a sense of belonging among children that manifests in later years. Despite the lag in effect, it appears that the factors that children are exposed to in early education, or prior to, ultimately influence later participation and engagement.

Unlike the other three outcomes, the Academic Index predicted academic performance one year later (in the same class), but not two years later. It did not predict performance in a different class environment. This suggests that academic performance may be more strongly related to the immediate environment than the other inclusive outcomes. Academic performance may be an outcome that requires constant input and dedicated structuring of the immediate educational context to promote continued improvement. Another possible explanation is that academic performance is less related to the stakeholder and demographic factors that were tested in this study. This study measured mostly Environmental factors. Arguably, engagement, participation and child interaction are largely consequences of the Environment. From the outset, a teacher can choose to allocate a child to a class activity, can pair the child with a highly interactive classmate and can scaffold tasks in such a way that the child is able to engage independently. On the other hand, academic performance could be more related to Activity Performance or Personal factors. For example, developmental abilities (language, memory, cognition) (Agostin & Bain, 1997; Ferguson et al., 2001); expanded core skills (Hatlen, 1996); or work-related (school readiness) (Kemp & Carter, 2000; Rule et al., 1990) could potentially have a stronger effect on academic performance than the Environmental factors tested in this study.

6.3.4 The Number of Factors Required to Predict Success

Another novel feature of this study was that it identified the number of factors that are potentially required to increase the likelihood of successful and unsuccessful outcomes for children with vision impairment. This has not been attempted in previous research, and it provides critical new information to stakeholders. The number of factors that predicted success for children with vision impairment varied between outcome and time period. The number varied from a minimum of two (to predict child interaction over two years) up to a minimum of six factors (to predict participation two years later, with at least one of the six factors being a demographic factor). As long as this number of factors was provided, any combination of the Index factors predicted relevant outcomes either one or two years later.

In practice, educators who are interested in promoting inclusion would aim to facilitate a child's overall inclusion rather than only one outcome. It would be insensible to only implement factors that promote success in one component. Thus, to promote inclusion, stakeholders should ensure that at least six factors are in place when children begin their education. Having fewer factors increased the likelihood of poor outcomes in at least one area of inclusion. Schools, parents and advocates now have a basis on which to audit and improve the situation in which children with vision impairment are educated. The results of this study indicate that ensuring at least six Index factors are in place will increase the likelihood for students with vision impairment to attain successful inclusive outcomes. The specific factors are discussed in detail in section 6.4.

6.3.5 Classmates

Interestingly, the Indices did not significantly predict the outcomes of classmates in this study. The inclusion of typically developing classmates appears to be more resilient than that of children with vision impairment. Most classmates performed successfully despite the adequacy of the Environmental or Activity Performance factors that they were exposed to. The Indices that were analysed in this thesis were comprised of factors that were specific to children with vision impairment rather than classmates. In a separate analyses, Indices that were specific to classmates were formed and tested (see section 4.9.3). None of these Indices significantly predicted classmate outcomes. This may be explained by the limited variance within the classmate group. Ceiling effects were observed in classmate QuIEM Child Interaction, Engagement and Participation scale scores. This is to be expected, since these scales were developed to assess the performance of children with disabilities. On the other hand, the SSRS was developed for use with all students. However, the Indices did not predict the classmate SSRS academic scores either. It is possible that the factors tested in this study were not relevant to classmates. While parent involvement (Domina, 2005), socio-economic status (Zill et al., 1995), and social skills (Ferguson et al., 2001) are commonly linked to the academic performance of typically developing students, other factors such as IQ, child care experience and family literacy environment have also been cited as strong predictors (Christian et al., 1998). These factors were not tested in this study.

Unlike classmates, the inclusive outcomes of children with vision impairment are responsive to the Environmental, Activity Performance and Personal factors that were tested in this study. A combination of the correct factors had a pervasive impact on their inclusive experiences. The specific factors that predicted inclusive outcomes will be further investigated in the next section.

6.4 FACTORS THAT PREDICTED INCLUSIVE OUTCOMES

It has been clearly demonstrated that the stakeholder factors that were tested in this study have a significant impact on the outcomes of children with vision impairment in regular education. Most of these factors are modifiable, and thus, have the potential to be improved in order to promote better outcomes for these students. The research has shown that it is important for these factors to be present at the commencement of early education in order to influence success. The findings confirmed that there was variation in the adequacy of the situation in which children with vision impairment were educated. As stakeholders have previously argued, the inclusive context changed from school to school (Crosby, 2002; Loreman & Deppeler, 2000).

This section provides a detailed examination of the factors that significantly predicted inclusive outcomes of children with vision impairment. A model of inclusion is presented to illustrate the impact of the stakeholder factors on inclusive outcomes. The positive and negative influence of relevant factors is discussed and the findings are compared to previous research. Finally, this section seeks to explain the reason that specific factors influenced particular in inclusive outcomes.

6.4.1 Model of Inclusion in Early Education

A model of inclusion in early education illustrates the major findings of this study (Figure 6.2). The model is based on the ICF model, and represents the stakeholder and demographic factors that were most influential to inclusion (i.e. they were included in most of outcome Indices or critical for the Index to accurately predict success). All stakeholder factors influenced at least one inclusive outcome. They were all included in at least one outcome Index. However, (1) social skills, (2) teacher training and experience, (3) teacher attitude and (4) adult involvement had the most substantial impact. These factors positively influenced all inclusive outcomes. In addition, (1) vision aides and equipment and (2) physical environment were important for inclusion. They were included in Indices that predicted three inclusive outcomes (all but Child Interaction). These factors formed a model of early education inclusion for children with vision impairment.

The demographic factors that were required for participation to be predicted – co-existing disabilities and socio-economic status – are also included in the model. Since staff support, individualisation and school attitude were important in predicting only one inclusive outcome, they were not included in the model. Parental involvement was excluded because it had a mixed influence on inclusion.

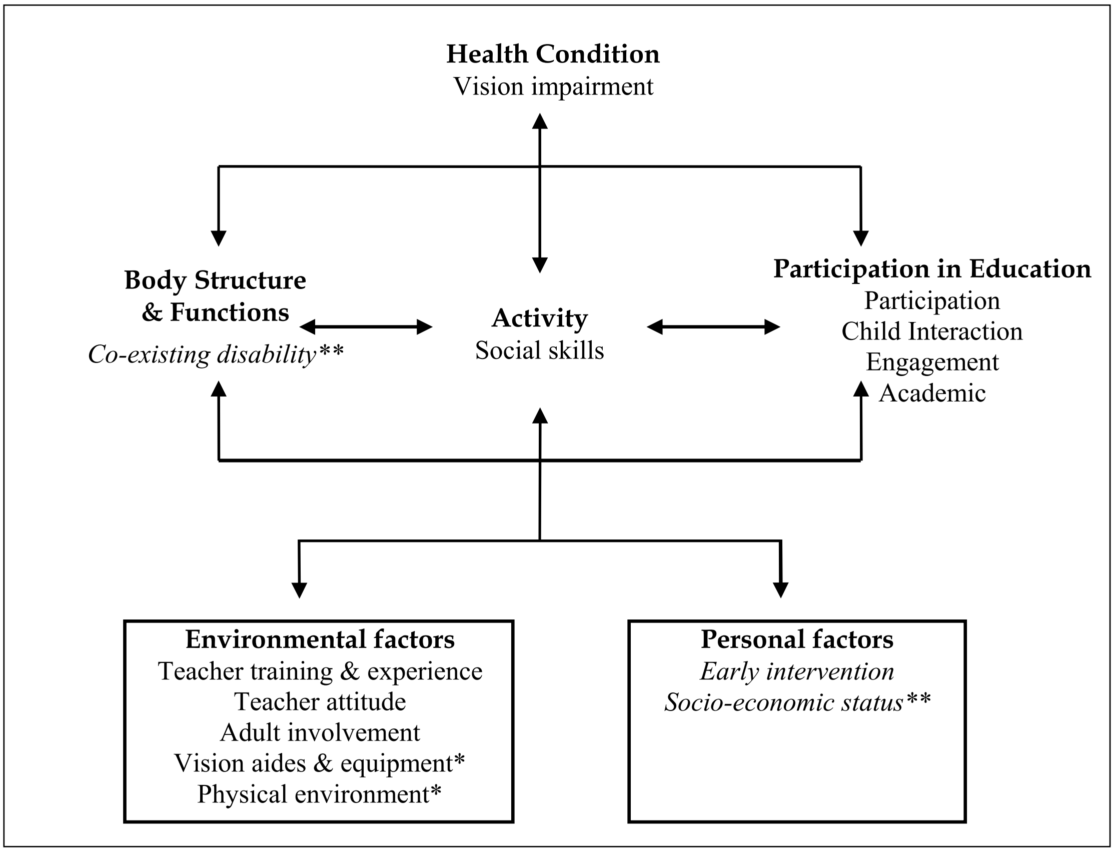


Figure 6.2. Model of inclusion in early education for children with vision impairment

Note. At least 6 factors are required to predict *all* inclusive outcomes up to two years later. Non-italic terms indicate that factors facilitate inclusion. *Italic* terms indicate that factors are a risk to inclusion.
* = significant influence on participation, engagement and academic performance up to two years later;
** = significant influence only participation up to two yeas later.
Figure adapted from the International Classification of Functioning, Disability and Health (WHO, 2001).

Since a longitudinal design was used for this study, it is likely that the factors that were present at the start of the first year influenced later student outcomes. It is less likely that this relationship was the other way around. Data were collected nine weeks after the commencement of school. It is unlikely that student experiences during those first nine weeks actually influenced the stakeholder factors (such as children's social skills, teacher attitude or level of adult involvement). However, this cannot be dismissed. Baseline data would improve the capacity of the study to conclude a causal effect (Portney & Watkins, 2000).

Of the nine factors that are included in the model, each of the Phase 1 stakeholder groups suggested at least five of the factors. The allied health professionals suggested all of these factors except for adult involvement and vision aides and equipment. The student group contributed to the least amount of factors in the model.

6.4.2 Factors that Positively Influenced Inclusion

The Index factors that combined to positively predict inclusive outcomes are described in this section. The potential reasons for their influence on specific outcomes are discussed. In addition, the adequacy of each of these factors is discussed.

6.4.2.1 Social skills

The social skills of children with vision impairment had a major impact on the inclusion that they experienced in early education. It is logical that students with better social skills behave more appropriately in regular class activities, even if they experience difficulty comprehending the task. Thus, teachers may be more inclined to assign these children to a class activity rather than to a specialised activity, promoting their participation. The SSRS social skills construct measured in this study was comprised of assertion, cooperation and self-control items (Gresham & Elliot, 1990). Children's self-control may help them to maintain attention and thus improve engagement and academic learning. It is likely that assertion and cooperation skills assist children to relate with others, thus improving the quality of their interaction with other children.

The significant impact of social skills on the inclusion of children with vision impairment is supported by previous research and expert opinion (Erwin, 1993; Gale & Cronin, 1998; Hatlen, 1996; Kekelis & Sacks, 1988). It is also supported by the strong base of evidence in the general education literature. As in this study, early social skills have been found to promote later social and academic performance (Alexander et al., 1993; Ferguson et al., 2001; Ladd, 1990).

The current study found that there is a wide variance in the social skills of young children with vision impairment. While some had above average social skills, others had below average skills. This variation was greater than that of their classmates.

This variation may explain the mixed findings that have been reported in previous research. While some studies found no difference in the SSRS social skills scores of children with vision impairment and normative data (Sharma et al., 2000) research that has used other measurement tools (Erwin et al., 1999; Palmer, 2005b; Read, 1989) or qualitative designs (Holahan & Costenbader, 2000) has reported differences in social skills.

The social skills development of children with vision impairment appears to be different to classmates. As was noted with academic performance, a gap emerged between the social skills of children with and without vision impairment during the two years of the study. Children with vision impairment had significantly poorer social skills than classmates at the end of the second year. As discussed in section 6.2.2, this may relate to the increasingly complex social demands, or higher teacher expectations among older children. Since previous studies have not measured the social skills of children with vision impairment over time, these fluctuations have not been reported before. It is possible that this gap between the social skills of children with vision impairment becomes even more obvious as they age. While further investigation is required, it is apparent that some children with vision impairment require intervention to promote or remediate their social skills development.

Fortunately social skills are potentially modifiable. There are two developmental stages relevant to this study: the preparation and promotion of early social skills development and the promotion and/or remediation of social skills among children in early education. Among young children with vision impairment, exposure to social situations are critical for the development of social skills (Sacks, 2006). Parents are the most important part of this. They can facilitate social interaction through physical modelling, consistent verbal feedback, tactile and interactive play, cues and exploration of early social interaction (Sacks, 2006). Education (which differ to typical interaction with sighted children), encouragement and feedback from therapists is essential to promote the use of consistent strategies. Therapists are critical to teaching parents these strategies. Exposure to peers provides young children with vision impairment opportunities to learn and expand their repertoire of developmentally appropriate social skills. For children in parallel play stages, children become accustomed to the presence of other children, and test and clarify ideas about them (Morrison & Metzger, 2001). As children develop cooperative play skills, they can practice techniques for turn taking, communicating and negotiating with peers. Exposure to groups of sighted and non-sighted children is recommended; in addition to mediation and modelling from adults.

A range of social skills intervention strategies exist for children from early education level onward. Limited social skills intervention material exists specific to children with vision impairment (who have needs relating to the visual aspects of socialising). Recently, Erin (2006) designed lesson plans for teaching early primary school children with vision impairment. These address: (a) non-verbal communication, (b) communication, (c) assertiveness, (d) participation in social rituals, (e) discussing vision impairment with others, (f) importance of social appearance, and (g) interaction with friends. Given that in this study, the social skills construct that predicted inclusion consisted of assertiveness, as well as self-control and cooperation; it may be beneficial to also include the latter aspects in social skills training.

Social skills interventions can comprise of three general methods: (1) Behavioural training (modelling, behavioural rehearsal, feedback); (2) Cognitive behavioural training (listening and observing others, considering thoughts and feelings, generating alternative outcomes); and (3) multi-component behavioural social skills training (Erin, 2006; Nagle, Erdley, Carpenter, & Newman, 2002). Behavioural, rather than cognitive approaches tend to be more effective with younger children, given their lack of abstract reasoning (Nagle et al., 2002).

Social skills interventions can be delivered in a variety of ways. Direct, intensive, individualised instruction/intervention from therapists has been found to have a significant positive effect on the social skill development of children with disabilities, evident in the classroom (Holahan & Costenbader, 2000). Social skills interventions using feedback from self, adult and/or peer feedback have proven effective in generalising specific social skills with primary school aged children with vision impairment across settings (Jindal-Snape, 2004, 2005). Finally, group social skills training have been effective in improving the assertiveness of adolescents with vision impairment (Kim, 2003). The setting of the intervention is cited as a particularly important component of social skills training. Skills taught in the classroom context, with peers are more likely to be generalised to real-life situations (Erin, 2006; Gimpel & Holland, 2003). For this reason, a classroom approach has been recommended. Programs administered to the whole class have been shown to be effective in increasing social problem solving and positive interaction with peers among at-risk preschoolers; and may be more effective than parent intervention alone (Barkley et al., 2000; Conduct Problems Prevention Research Group, 2002). Importantly, these whole of class social skills programs are also effective in preventing social problems among typically developing children (Barkley et al., 2000).

However, the pervasive influence of social skills is not to be dismissed. Promoting the social skills of children with vision impairment has the potential to improve their social, curricular and academic inclusion. If delivered in a whole-class approach, social skills interventions may promote the generalisation of pro-social skills for children with vision impairment as well as their classmates.

6.4.2.2 Teacher characteristics

Three teacher characteristics positively predicted all inclusive outcomes for children with vision impairment: teacher training and experience, teacher attitude towards inclusion and adult involvement. It is feasible that teachers with such positive characteristics are aware of, and/or are more willing to make use of inclusive strategies to provide accessible class activities that facilitate participation in the regular curriculum. It is also likely that they would be able to, or more likely to challenge students at an appropriate level. Appropriately challenging children may sustain children's engagement in tasks and promote learning of academic concepts (Guberman, 1999). Finally, adults who provide an adequate balance of involvement may promote learning and act as a mediator between children with and without vision impairment, thus promoting peer interaction (Rief & Heimburge, 2006; Tomlinson, 2000). These findings are consistent with previous research demonstrating the effect of teacher training (Koenig & Farrenkopf, 1997; J. Power & Angela, 2006); teacher attitude (Center et al., 1988); and adult involvement (Crocker & Orr, 1996; Erwin et al., 1999; Workman, 1986) on the inclusion of children with vision impairment.

The teachers in this study generally had a positive attitude towards including children with disabilities. Previous Australian research has also reported positive teacher scores on the Teacher Opinion Questionnaire (Lanier & Lanier, 1996; Monahan et al., 1996). While some international studies have found a positive teacher attitude towards inclusion (Jobe et al., 1996), others have reported neutral (Cook, 2004); mixed; and negative attitudes towards inclusion (Vaughn, Reiss, Rothlein, & Tejero Huges, 1999). Contrary to previous research (Jobe et al., 1996; Praisner, 2003), the attitude of teachers in this study did not vary depending on the severity of the children's impairment or the complexity of their disabilities. It is possible that the positive attitude is a reflection of the measurement tool, or positively biased teacher report.

Adult involvement differed between children with and without vision impairment. It is expected that adults would provide different or greater input with students with vision impairment, given their disability requirements and scaffolding needs. However some concerning results emerged in this study. Adults in the class (teachers, education assistants and/or volunteers) were consistently more over-involved with children with vision impairment compared to their sighted peers. Some adults completed tasks for the child, rather than providing a balance of interaction to promote their involvement. There are several possible reasons for this. (1) The tasks provided to the children may have been too challenging or presented in an inaccessible format; thus the student could not complete the task independently. (2) In an attempt to involve the child, adults may have compensated for the child's difficulties in accurately or quickly completing a task. (3) Adults may have been unaware of ways to provide appropriate involvement; perhaps due to limited training (Russotti & Shaw, 2001) (see the end of section 6.4.2.2).

The adults in the study were able to improve their level of involvement with students with vision impairment throughout the year. This indicates that adult involvement can change. However, the research has also shown that the involvement at the start of the year is critical. Strategies put in place to improve this involvement as early in the year as possible are most likely to have a long term impact.

Strategies exist to resolve this issue. The strategies revolve around careful team planning and then the use of behavioural techniques. Firstly, instruments designed by the Vermont education department may aid in solving this dilemma. They include the IEP team completing: an *Intensive Needs Checklist*, a *Student's Abilities and Assistance Needs Matrix*, and a *Plan for Para-educator Assistance* (identifies where, when and how the education assistants will provide support and how the team will encourage independence in the student) (Mueller & Murphy, 2001). These plans articulate to each member of the IEP team exactly how the child's independence will be encouraged, and how adults will (and will not) assist. The Student's Abilities and Assistance Needs Matrix documents (1) what the student do without assistance, (2) what the child cannot do and needs accommodations or (3) assistance to complete. The Plan for Para-educator Assistance documents agreement on exactly how the education assistant will encourage independence (Ferrell et al., 1998). Both plans identify ways to promote social acceptance and how peers will be utilised. Completion of such agreements early in the year may help to ensure that appropriate adult involvement is provided throughout the year.

Secondly, classroom staff should use appropriate behavioural techniques when interacting with and assisting students with vision impairment. In particular, the proper use of graduated prompts, cues and feedback can increase the independent functioning of students (Petscher & Bailey, 2006). Fading of such feedback – from physical feedback to verbal and/or tactile and then to natural cues and decreased adult proximity encourages skill development and can reduce children's dependence on adults. Classroom personnel can be effectively taught such practices through in-service training, specialist prompting and self-monitoring (Alston & Kilham, 2004; Petscher & Bailey, 2006; Storey et al., 1993). Improving adult's involvement with students with vision impairment may also improve their inclusion.

Teacher training and experience was another factor that positively predicted inclusion. In addition to having a direct influence on the inclusive outcomes of students, teacher training was also related to improved inclusive practices. Teachers who had more training had more adequate physical environments, reported better individualisation and provided more appropriate involvement with the student with vision impairment (see Appendix W). Most of the teachers had previously taught a child with a disability and it is highly likely that they will encounter more students with disabilities in the future.

The level of training and experience reported by teachers in this study was relatively low. Relatively few teachers who participated had completed pre-service units about special or inclusive education. This may reflect temporal issues associated with the inclusion movement. The teachers had graduated from teaching degrees an average of 15 years ago. This was prior to the emphasis of inclusive education in classes, let alone in training. Correlations support this further. The more experienced teachers in this study were less likely to have completed a pre-service unit about inclusive education or vision impairment (see Appendix Tables W.1 and W.2). Changes to pre-service inclusive preparation of teachers are only recently coming into effect. Best practice training comprises of: compulsory units about disability, the integration of inclusive theory and practices throughout the general course curriculum, and compulsory practical experience with students with disabilities (Campbell, Gilmore, & Cuskelly, 2003; Carroll, Forlin, & Jobing, 2003). Australian universities still lack uniformity in providing dedicated training in inclusion, and this best practice training is only offered in a small proportion of teacher courses (Loreman et al., 2005).

While the limited pre-service training reported in this study may be explained by the changing university climate, it was expected that in-service training would be adequate for most teachers. However, most teachers who participated during 2005 or 2006 continued to receive less than one annual day professional training in inclusive education and/or vision impairment. Since most teachers with a new student with vision impairment attend a professional development day, this means that they had received no further training about inclusion throughout the year. This is incongruent with key workforce up skilling strategies aimed to reform inclusive education (DET WA, 2004). It has been suggested that in-service education should be provided on-site; using a hands-on approach that highlights relevant inclusive strategies rather than focusing on theory (Loreman et al., 2005).

The inclusive training provided to teachers in this study did not appear to be adequate. Adequate training and constructive experience should be a priority for improvements in the educational sector.

6.4.2.3 Physical resources

Two resource factors had a significant positive impact on all aspects of inclusion, except child interaction: (1) vision aides and equipment and (2) physical environment. This is compatible with previous research. Vision aides have been linked with academic performance (A. L. Corn, Wall, & Bell, 2000; A.L. Corn et al., 2002; Naomi & Tyagi, 2007), and the environment has been observed to influence performance in early education settings (Davis & Hopwood, 2002a; Kekelis & Sacks, 1988). It is reasonable to conclude that children with vision impairment who are able to easily access their physical environment and functionally use residual vision or other senses (e.g. use of devices, contrast, or tactile features) are better able to participate in regular classroom activities and sustain engagement in tasks. Because it is less likely that children would miss critical learning concepts, they may also be better able to learn from educational experiences and attain greater academic performance. Traditional learning theories support this notion. Concepts are learnt through interaction with the environment, therefore greater interaction facilitates concept development and learning (Inhelder & Piaget, 1958).

Neither the physical environment nor equipment significantly influenced child interaction in this study. Arguably, assistive aides and specific visual features of the environment are rarely used in child interaction and play, therefore it is reasonable that they did not exert a significant influence in this study (McGaha & Farran, 2001). These results are contrary to other findings, which argue that specialised vision aides can positively (Cooper & Nichols, 2007) or negatively (A. L. Corn, 1990; Ingram, 2004; Smith et al., 2004) impact on the interaction of young students.

The physical environment was of an adequate standard in most classrooms. The furniture (e.g. large screen computer monitors, curtains drawn to reduce glare), the layout of the class was often appropriate or had modifications (e.g. painted poles, child seating position), the centres that were used by all students generally had materials (e.g. tactile books) that were accessible to the student with vision impairment. In addition, teachers who taught throughout the first year were able to further improve the adequacy of the environment during the year. These trends were maintained by teachers at the end of the second year. This could be a reflection of the time taken to implement changes in the physical environment. The Time 1 observations were conducted nine to 15 weeks after the commencement of the school year. It obviously took more time for teachers to completely adapt the environment to the needs of the child. Ordering of equipment, formulating and implementing plans may take time in schools. However, given the strong effect that the physical environment has upon the inclusion of children, it appears imperative that these changes are implemented earlier in the year. This would require dedicated and early planning from all stakeholders – parents, specialists, teachers and principals.

In contrast to the typically adequate general physical environment, the provision of specialised vision aides and equipment was poor in both years of the study. This related to accessibility issues (availability and timeliness) as well as training (of teacher and student). The lack of accessibility is potentially a teacher-driven issue. It is common for teachers to have a negative attitude towards using recommended specialised equipment, such as low vision devices, in the classroom (Gasparetto et al., 2006; Smith et al., 2004). This is associated with a lack of knowledge and confidence with the equipment. In some cases, the equipment may not be available to the class due to limited loan pool equipment (from education departments) or a lack of funding to purchase the equipment (education department and/or school level). Once again, training was limited, both for student and teaching staff. Some educators may be under the impression that vision aids and equipment are not particularly necessary for younger children. This study has confirmed that such equipment has a significant impact on the educational outcomes of young children with vision impairment. The effect is long term. It is essential that recommended aids are adequately provided to the students from the commencement of early education.

6.4.2.4 Individualisation

Individualisation had a minimal effect on the inclusion of children with vision impairment. It combined with other factors to predict engagement, but no other outcomes. Individualisation reflected teachers' description of the special strategies, routines and instruction there were implemented to address the student's critical learning and developmental objectives. As presumed by previous literature, these individual strategies (such as using small group activities, clear verbal directions and provision of large print or concrete examples) may improve engagement by promoting independent access to activities, comprehension of instructions, and access to appropriate print/pictorial media (Gale & Cronin, 1998).

The individualised strategies reported by some teachers included withdrawing the child from class activities to work on specialised skills. Therefore, it is reasonable that individualisation did not effect participation or child interaction. Withdrawing the child from class activities would reduce opportunities for participation and child interaction. But it was expected that individualisation promote academic performance. Learning opportunities that sufficiently meet the individual needs and objectives of the child would logically promote learning. The reason for the limited influence is unknown and may require further examination.

Although many teachers had limited training, all had a *good* level of knowledge regarding ways to individualise the curriculum for the child with vision impairment. This indicates that, at least, teachers are aware of inclusive practices. Since data were based on teacher reports rather than observation, it is possible that results were positively biased (MacCuspie, 1996; Monahan et al., 1996; RBS & RIDBC, 1999). It is unknown whether teachers actually implemented these individualised strategies in their daily routine.

6.4.3 Factors that Negatively Influenced Inclusion

Four individual factors exerted a negative influence on the inclusive outcomes of children with vision impairment: (1) staff support, (2) early intervention, (3) school attitude, and (4) parent involvement.

6.4.3.1 Staff support

Staff support measured teacher and principal perception of the amount of specialist input, personnel, time, training and resources allocated to teachers. It was expected that adequate support would enable teachers to plan, adapt and implement curricula that match the child's abilities and needs – thus promote engagement. However, it had a negative effect on student engagement.

There are two likely explanations for this. (1) Support may have been appropriately allocated. Teachers with more support provided to them (rated by teachers and principals as *sufficient*) may have needed this support because their students were at risk of poor performance. Teachers with limited support (rated as *insufficient*) may have perceived that they needed extra support to cope with the stressors and time commitments of inclusion. While there was the perception that teachers needed the extra support to cope personally, the extra support may not have been required to improve the student's inclusive outcomes. The students may have actually been coping well in the regular setting. Although teachers with more support did not teach students with more severe disabilities (see Appendix W), the students may have had other behavioural or developmental problems that were not measured in this study. (2) Support may have been related to the presence of classroom personnel. Classes with higher staff support may have had an education assistant. Given the potential risks of inappropriate use of education assistants (Alston & Kilham, 2004; Giangreco et al., 2001; Kekelis, 1992a; Mueller & Murphy, 2001), it is possible the these personnel increased the proportion of over involvement with students, thus reducing engagement. Indeed, staff support was positively correlated with adult over involvement at Time 1 (see Appendix Table W1); however there was a negative correlation at Time 3 (Appendix Table W3).

The relationship between staff support and inclusive outcomes may require further investigation. The type of support as well as the appropriateness of support may need to be considered. The effect of classroom personnel is a pertinent topic. What is clear is that many principals and teachers perceived that the support provided to teachers was less than adequate.

There is consistent evidence describing the distinct lack of support (Ingram, 2004; Loreman, 2003; RBS & RIDBC, 1999), training (Crosby, 2002; Llewellyn et al., 2002) and resources (Monahan et al., 1996; Norman et al., 1998; OECD, 2005) available to support inclusion, both in Australia and internationally (J. O'Neil, 1994). Some teachers have reported these same sentiments in this study. While there was some non-significant variation over the two years, between 20 to 74 percent of teachers of students with vision impairment reported a *poor* level of training and experience, vision aides and equipment, or staff support. The remainder of children experienced *good* conditions. These findings indicate that a major fear associated with the movement away from specialist education settings - the lack of specialist equipment, knowledge, skills and support to meet the needs of children with disabilities (Blatch et al., 1998; Leyser & Heinze, 2001; J. Power & Angela, 2006; Royal National Institute for the Blind, 1996) and vision impairment (DET NSW, 2002; Gale & Cronin, 1998) is realised in some cases. However, the findings particularly emphasise the variation in these support factors from one class to another (DET WA, 2002; Llewellyn et al., 2002; Odom et al., 1999). Inadequacies in support, training and specialised resources may be linked to funding restrictions and procedures (Suvak, 1999). Additional funding would help to obtain extra physical resources, to employ extra support personnel for classroom assistance or leave time (to attend training courses or plan lessons), and to provide extra training (Crosby, 2002; Odom et al., 1999; Organization for Economic Cooperation and Development, 2005; Wall, 2002). Changes in departmental policies and school procedures may also help to improve the support and up-skilling of teachers.

6.4.3.2 Early intervention

Having had early intervention (therapy or education) was a negative predictor of participation, child interaction and academic outcomes for students with vision impairment. This seems to contradict established evidence about the effectiveness of early intervention on developmental and educational outcomes (Berrueta-Clement et al., 1984; Bowe, 2004; Innocenti & White, 1993; Martineau et al., 2001; Shonkoff & Hauser-Cram, 1987). However, instead of reflecting the effectiveness of early intervention, these results appear to reflect *risk* and *need*. Participants in this study with more severe co-existing disabilities had received greater amounts of early intervention (Appendix Table W1). Children with multiple disabilities have more complex needs and greater risk of developmental setback. Given this, it is probable that the children who received early intervention required the intervention to address developmental issues. The developmental difficulties and co-existing disabilities, rather than the intervention itself may have placed them at risk of poor outcomes (Buhrow et al., 1998; Telec, 2001). Other studies have reported the confounding effect of disability severity on the measurement of early intervention outcomes (Center et al., 1989; Loreman, 2003). It is probable that children with typical development did not receive early intervention. These typically developing children have a better chance of successful performance in regular education.

6.4.3.3 School attitude

Unlike teacher attitude, positive school attitude towards inclusion had a negative impact on academic performance of children with vision impairment. This negative relationship was unexpected and contradicts previous findings that positive school ethos promotes at least academic performance (Center & Ward, 1987; Forlin, 1995). Possible explanations for this relationship exist. Firstly, parents of children with vision impairment who are *at risk* in early education may seek out and enrol their children in schools with a more well-known inclusion policy. The second explanation is a measurement issue. Schools that were committed to inclusion may have expressed the realistic difficulties and misgivings that they experienced with inclusion, thus achieving lower QuIEM Program Goals and Purposes scores. It has been found that principals with less experience with inclusion may have unrealistic expectations regarding the ease of the process (Miedel & Reynolds, 1999; Parker et al., 1997). Schools that infrequently include students with disabilities may have more unrealistic, thus higher QuIEM scores. Since the negative impact of school attitude remains unsupported by previous findings, this need to be considered with caution and further investigation is required.

Perhaps due to these issues, a discrepancy was found between the school attitude and teacher attitude towards inclusion of children with disabilities. The majority of teachers of children with vision impairment reported a positive attitude on the Teacher Opinion Questionnaire. Most of the schools had poor levels of attitude as reported on the QuIEM Program Goals and Purposes scale. It is possible that differences found between the overall school and teacher attitude may stem from difference in attitude often reported among principals and teachers (Bennet, 2003). However, it is probable that there were differences between the way that teachers viewed the inclusion of a student in their classroom and the climate within the school as a whole. The QuIEM scores indicate that several aspects in the schools were lower than expected. Few of the schools had documented their commitment to inclusion in a philosophy. Of those that had, staff had limited knowledge about it or adherence to it. Some teachers and principals noted that the school placed a limited emphasis on or commitment to inclusion. Indeed, there has been concern about the commitment of schools towards inclusion (Center & Ward, 1987; Forlin, 1995). To foster inclusion, these aspects may need development. However, the QuIEM items focused heavily on formal school philosophy (in particular, mission statements), which may have differed to the actual culture and philosophy of inclusion throughout the schools. Since both professions (principals and teachers) reported on the QuIEM Program Goals and Purposes scale, their views may have in effect 'cancelled out' the true score.

It has been suggested that many schools require a serious shift in the way that inclusion and teachers providing it are viewed within schools (Loreman, 2003). Principal leadership is critical to create a school climate that promotes and rewards inclusive practices by embedding inclusion in curriculum development, teaching, in-service training and resource selection across the school (DET QLD, 2006).

6.4.3.4 Parent involvement

Parent involvement had a mixed effect on inclusive outcomes. Parent involvement at the start of the year positively predicted academic performance. This corresponds with a strong body of general education research that promotes the positive influence of early parent involvement on later academic achievement (Domina, 2005; Jeynes, 2003; Nadon & Normandeau, 1997). The amount of parent involvement, however, had a negative impact upon participation and engagement of children with vision impairment. This is a plausible finding. The mixed effect of parent involvement on child outcomes in primary school is common – with amount, type and reason for involvement altering the effects of involvement (Mueller & Murphy, 2001). Furthermore, as previously suggested, highly involved parents may strongly advocate for “maximum coverage by adults” (Domina, 2005), in turn leading to increased withdrawal or specialisation of the curriculum, and thus lower participation. On the other hand, parents whose children demonstrate behavioural problems, such as non-engagement, may be more involved in their child’s behaviour (Kilgallon & Maloney, 2003). Dedicated examination of these components of parent involvement would provide useful information for the education of children with vision impairment.

6.4.4 Demographic Factors that Influenced Inclusion

In addition to the stakeholder identified factors, sensitivity analysis also investigated the effect of demographic factors, in order to comprehensively address the heterogeneous characteristics of the population – vision impairment, co-existing disabilities and socio-economic factors. The demographic factors only had a significant impact for predicting participation two years later. In addition to the stakeholder factors, at least one of two demographic factors (absence of co-existing disabilities and/or having a high family income) was required to predict success. Children who had co-existing disabilities, or were from lower socioeconomic backgrounds were at a high risk of poor participation in class activities. Indeed, children with vision impairment and other disabilities generally have more developmental difficulties and complex educational needs (Chen, 1999a; Ferrell et al., 1998; Rogers, 1996). The findings also reflect the pervasive influence of socioeconomic status on educational performance (Foreman, 1996; Zill et al., 1995). These factors are obviously not directly modifiable, thus, stakeholders should be aware of the increased risk that children with vision impairment with additional disabilities, and from low income families experience.

Fortunately, besides participation, no other outcome Indices included required the presence of demographic factors to predict successful performance. Although demographic factors such as having another disability, or level of vision impairment individually put children at risk of poor engagement, child interaction or academic performance, these can be overcome by ensuring that a combination of Index factors are present at, or before early education. This further highlights the strength of the Activity Performance, Environmental and Personal factors tested in this study.

6.4.5 Summary

This section has discussed the factors that predicted inclusive outcomes of children with vision impairment in early education. A model of inclusion in early education was designed to reflect these factors. Six factors positively predicted most inclusive outcomes for children with vision impairment: (1) social skills, (2) teacher training and experience, (3) teacher attitude, (4) adult involvement, (5) physical environment, and (6) vision aides and equipment. Since all of these factors are modifiable, knowledge about the interventions to enhance the current quality of these factors was discussed.

Unexpectedly, four factors had a negative influence on inclusive outcomes: (1) staff support, (2) early intervention, (3) school attitude, and (4) parent involvement. These findings were discussed in the educational context. Finally, demographic factors were important in predicting only one outcome for children with vision impairment – participation. This highlights the strength of the stakeholder factors that were measured in this study. It also clarifies that the perception of stakeholders in Phase 1 was insightful and accurate. Generally, provision of these stakeholder factors can protect children even from pervasive socio-demographic risks.

6.5 CONCLUSION

This chapter discussed the findings of the main phase of the study. It began by considering the level of inclusion experienced by the participants with vision impairment. For some children, their education resembled integration more-so than inclusion; with less than adequate social and curricular outcomes. The outcomes reported are supported by previous research. A novel aspect of this research was the focus on engagement and participation – important curricular aspects of inclusion. These were discussed in relation to service delivery methods of specialists; particularly the pros and cons of withdrawal and in-class support. Finally, the relative change in academic performance of children with and without vision impairment over time was justified by changes in teacher expectations and relative access to the curriculum.

Secondly, the ability to predict the inclusive outcomes of children with vision impairment was explored. Similar to previous research, this study found that a combination of factors is able to protect children from poor outcomes. A model of early education experiences was provided to extend these findings based on early intervention theory. There is the potential that the factors provided to children in early education could affect their functioning well beyond the two years measured in this study. Next, consideration was given as to why some Indices predicted outcomes over two years and other (Academic) predicted success over just one year. It was argued that academic performance may be linked to more immediate environmental factors.

Finally, the combination of at least six index factors that are required to increase the likelihood of overall inclusion for students with vision impairment was discussed. Presently, many of these factors (the quality of the situation that children are educated in) is less than desirable. This is supported by previous concerns and research. This chapter investigated possible strategies to improve or rectify these situations, so that the factors can be provided in early education. These strategies form the basis for the recommendations of the study.

The next chapter concludes the research and presents these recommendations.

CHAPTER 7

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

7.1 INTRODUCTION

In chapter 6, major findings of the study were discussed in the wider context of vision impairment and inclusive education. Many novel findings have emerged from this research and pose important implications for the field. A summation of the main findings is presented in this chapter. These must be interpreted with an understanding of the strengths and limitations of the research. Strengths and limitations are reported after the summation. Finally, recommendations are provided for policy makers, accreditation bodies, principals, classroom teachers, specialists and parents.

7.2 OVERVIEW OF THESIS

The study was conducted in two phases. The aim of the first, formative phase was to select factors that stakeholders perceive to be most important in influencing the inclusive outcomes of children with vision impairment in regular early education in the current Australian context.

There were three principle aims of the main study undertaken in Phase 2:

1. to describe the situation that children with vision impairment are exposed to in regular early education;
2. to determine the inclusive outcomes (participation, engagement, child interaction, academic, and overall) of children with vision impairment in regular early education compared to children without vision impairment; and
3. to determine the influence of stakeholder identified factors on the inclusive outcomes of children with vision impairment in regular early education.

A summation of the key findings addressing these aims is provided in the next section.

7.3 CONCLUSIONS

Eight main conclusions can be drawn from the study. These are described below.

1. Stakeholders perceived that mostly Environmental factors influence the inclusive success of children with vision impairment in early education.

The top ten stakeholder ranked items were: (1) inclusive attitude, (2) individualisation, (3) staff support, (4) parent involvement, (5) teacher training and experience, (6) early intervention, (7) physical environment, (8) social skills, (9) adult involvement, and (10) vision aides and equipment. Eight of these were Environmental factors. This reflects contemporary attitudes towards inclusion.

2. Five factors were commonly inadequate in early education situations.

The (1) accessibility and adequacy of vision aides and equipment; (2) quality of staff support; (3) amount of teacher training, and (4) school attitude towards inclusion was less than adequate in many classes. (5) Classroom staff were typically more over-involved with children with vision impairment compared to classmates.

3. Teachers improved some aspects of the class environment over time.

Teachers who taught throughout the entire first year improved the physical environment, making it more appropriate for children with vision impairment. Staff became more appropriately involved with children with vision impairment over time.

4. The difference in the social skills of children with and without vision impairment widened over time.

There was no difference in social skills of children with and without vision impairment during the first year. However, children with vision impairment had significantly lower social skills scores at the end of the second year.

5. Children with vision impairment experienced poorer inclusive outcomes than classmates.

Children with vision impairment participated in fewer class activities, were less engaged in activities and had poorer child interaction compared to classmates during the two years. There was no difference in the academic performance of children with and without vision impairment at the beginning of the study, but differences emerged over the two years, such that at the end of the two years children with vision impairment had significantly lower academic performance than classmates.

Some children with vision impairment attained successful inclusive outcomes. However, a greater proportion of children with vision impairment experienced *poor* performance in *all* aspects of overall inclusion than their classmates, whereas more classmates attained *good* performance in all aspects of inclusion.

6. A combination of stakeholder factors predicted the inclusive outcomes of children with vision impairment up to two years later.

The stakeholder factors that children with vision impairment were exposed to in early education had a lasting effect on their inclusive outcomes. Each of the outcome Indices predicted successful outcomes of children with vision impairment either one and/or two years later. These indices can explain the variation of inclusive outcomes that was found among children with vision impairment.

7. At least six stakeholder factors were required to predict all inclusive outcomes up to two years later.

Depending on the outcome of interest, presence of up to six (of seven specific) factors increased the likelihood that children with vision impairment achieved successful inclusive outcomes. If fewer than the required number of factors were present, the likelihood of unsuccessful inclusive outcomes of children with vision impairment increased.

In particular, the presence of *good* (1) social skills, (2) teacher training and experience, (3) teacher attitude, (4) adult involvement, (5) vision aides and equipment and/or (6) physical environment had a positive influence. These are all potentially modifiable variables. However, having had early intervention (i.e. having required it) posed a significant risk to successful inclusion. In addition, two demographic factors were pervasive, and significantly increased the likelihood of unsuccessful participation: the presence of a co-existing disability or a low socio-economic background.

8. A combination of stakeholder factors tested in this study did not predict the inclusive outcomes of sighted children without vision impairment.

While the stakeholder factors significantly affected the inclusive outcomes of children with vision impairment, they did not affect classmates. The inclusive outcomes of classmates appear more resistant to Environmental or Activity factors.

7.4 STRENGTHS AND LIMITATIONS

The strengths of this study included the design, analysis and matched sample used. The properties of the measurement tools and the size of the sample posed limitations to the findings. This section describes and justifies these issues.

7.4.1 Design and Analysis

The design and analysis used in the study were suitable and relevant to the characteristics of the population being measured. A comprehensive formative phase was conducted to inform the main study. This ensured that the independent variables that were measured in the main study were directly relevant to the contemporary Australian context. The data collection method used in the formative phase (NGT) was an appropriate way to generate stakeholder ideas, given that power differentials existed between particular stakeholder groups (e.g. teachers and their ex-students). In addition, the qualitative analysis that was used was governed by an overarching, contemporary framework (the ICF). The analysis was verified by agreement from three independent raters to increase trustworthiness. The overall rank order analysis was systematic and transparent.

The prospective, longitudinal, cohort design used in the second phase strengthened the study. By monitoring the classroom situation and outcomes of children over two years, it was possible to determine whether differences persisted or developed over time (Kirchner, 2000). While cohort studies are not as reliable as randomised controlled studies, they are preferred to case control studies, since they involve fewer statistical problems and generally produce more reliable answers.

The non-parametric analysis used in the study suited the non-normal distribution of the data. Due to the small sample size, it was not possible to construct a regression model to test the impact of the stakeholder factors on outcomes (Dawson & Trapp, 2001). However, experts have stated that "creative and careful thinking to develop strong quasi-experimental designs is urgently needed to improve the research base" about the inclusive education of children with vision impairment (Kirchner, 2000, p. 1122). As such, an innovative analysis was designed to focus on how particular factors caused variation within the groups and recognise individual differences. Both children with and without vision impairment were classified according to the adequacy of stakeholder factors they experienced. This ensured that the study focused on the impact of contextual factors rather than attempting to explain outcomes based on impairment alone (Kirchner, 2000). The formation of Indices and ROC curves analysis is based on strong epidemiological research methods and provides useful, easily understandable results for clinical use (Katzmarzyk et al., 2004; Perneczky et al., 2006; Sung et al., 2007).

7.4.2 Sample and Power

The small sample and low response rates in Phase 1 and 2 are acknowledged as limitations to the study. Despite comprehensive recruitment (within finite financial and human resources), the response rates for both Phase 1 and 2 were low.

In Phase 1, the recommended group size of between five to eight participants was met in three of the five groups. There were fewer participants in two groups. However, the NGT method was selected to increase potential participation. It was hypothesised that participant requirements of the NGT meetings (i.e. physical group attendance) posed a lower recruitment and time risk than requirements involved in other methods, such as the Delphi survey (i.e. numerous and repeated responses required from relatively anonymous participants would likely result in large drop-out rates). In addition, given that stakeholders from different Australian states have raised similar concerns about inclusive education (Llewellyn et al., 2002; Loreman & Deppeler, 2000; Wills & Jackson, 2000a) it was hypothesised that stakeholder views were consistent throughout Australia. As such, participants from only Western Australia were recruited for the NGT meetings.

Relative to earlier childhood vision impairment research, the sample size in the second phase of this study was reasonable. As described in section 4.4, the sample size of children with vision impairment in the first year (n = 20) provided adequate power to determine the influence of social skills on academic performance. However, the smaller sample in the second year (n = 13) posed limitations to the power of the study. The study had 72.5% power at a 5% Alpha level for detecting a significant variance from zero, given that the correlation between SSRS social skills and academic performance of children with vision impairment over two years was .65 (p = .032) (NCSS, 1996).

Unlike other childhood vision impairment studies, a comparison group was used for the second phase of this study. This is a major strength of the study. The matched sample that was used in this study is commonly used in classroom based research and is reliable method (second-best only to a randomly selected control group) (Kirchner, 2000). The recruitment of children from the same schools ensured a matching of socio-economic backgrounds within the participant clusters (Kirchner, 2000). Further statistical analysis demonstrated that this was so.

While classmates were used as a comparison group, the statistical power for comparing classmates and children with vision impairment was low. In the first year, the 20 children with vision impairment and 37 classmates provided 61.4% power at a 5% Alpha level for detecting a significant difference between the groups, given that the correlation between SSRS social skills and academic performance of children with vision impairment one year later was .78 versus .36 for classmates (NCSS, 1996). A power calculation could not be conducted for the second year because the classmate correlation over two years was non-significant (r = .15, p = .526).

While these power limitations existed, the sample that was required for adequate power (n = 29 children with vision impairment at Time 3 and n = 90 classmates throughout the study) was not feasible for three main reasons. (1) Dedicated recruitment (including recruitment of a different sample each year) was conducted in four states. Additional Australian states (thus geographical areas and data collection time) would have been required to further increase the sample of children with vision impairment. (2) Given time restrictions of the study, it was not possible for the one researcher to observe all the 119 children required. The sample size required would have extended each data collection period to approximately 22 weeks (two semesters). This did not suit the time periods required for the study (e.g. Time 1 observations would have extended to the middle of the year). (3) Classmates were not the focus of this study. Previous research has investigated factors that influence their success, and it was deemed unnecessary for this study to significantly contribute to that knowledge with a large classmate sample (Agostin & Bain, 1997).

It is hypothesised that if the required sample size and power were met, the outcome Indices would have significantly predicted more of the outcomes for each of the Time 3 data period for children with vision impairment (i.e. academic competence also). If the study had a greater statistical power it is also probable that the outcomes of classmates, particularly in Participation would have been predicted by some of the outcome Indices.

It is acknowledged that the heterogeneity of the sample of children with vision impairment and the comparison group may have added confounding variables to the study, in particular, the inclusion of (1) children with and without co-existing disabilities, (2) different levels of vision impairment, and (3) students attending education in three different Australian states (which have differing curricula, policies and funding arrangements), (4) the number of children in each classmate cluster varied from two to five. As mentioned, analysis was conducted to determine the effect of vision impairment severity and co-existing disability status both for children with and without vision impairment (see section 4.9.3).

7.4.3 Measurement

Measurement tools with strong psychometric properties were sought and used where possible. The SSRS, Teacher Opinion Questionnaire and Parent Involvement Questionnaire have existing and adequate psychometric properties. The QuIEM and the researcher-designed tools did not have proven psychometric properties. While this poses a limitation to the study, there was a strong rationale for using these instruments.

The QuIEM has standardised and instructions for administration, rating and scoring, as well as providing a quality rating to interpret the data. Secondly, the independent and objective nature of the scales (for assessing Adult assistance, Child interaction, Participation and Engagement) through observation of actual behaviours aids in eliminated bias from teacher and parent ratings. Teacher bias has been reported for such ratings of children's social performance (Bennet, 2003) and such potential for bias or inaccurate reporting existed if teachers were expected to report their quality of input with the child, or enabling the child to participate in the classroom. The QuIEM is multi-purpose in nature; the scales measure a comprehensive range of outcome variables and environmental factors that were required in this study. Finally, the QuIEM is one of the few tests found to assess social interaction and participatory outcomes, as well as independent variables as defined in this study. The Index for Inclusion (Booth & Ainscow, 2002) was considered to assess environmental aspects of the school and class, however this was a checklist format only and did not comprise of a scoring component.

In addition, strategies were utilised to increase the potential reliability and validity of these scales: (1) face validity was formally assessed to determine applicability of the scales to the constructs and population being measured; (2) one researcher conducted all observations; (3) acceptable inter-rater reliability was attained for the main rater (Fan & Chen, 1999); (4) teachers were asked to complete questionnaires at the same time; and (5) the same teachers participated where possible.

The SSRS American norms were used to determine competence levels for social skills and academic competence. The lack of Australian norms poses a limitation to the study, however only two social skills measurement tools were found to include Australian normative data: (1) Developmental Behaviour Checklist and (2) Vineland Adaptive Behaviour Checklist. These instruments were not suitable for the study. The Developmental Behaviour Checklist (Einfeld & Tonge, 2003) measures problem behaviours and emotional disturbances rather than adaptive, pro-social skills. Furthermore, though data exist to adjust North American norms of the Vineland Adaptive Behavior Checklist to match the Australian population (de Lemos, 1989) this tool does not assess social skills using the definition required for this study. Finally, while the Matson Evaluation of Social Skills with Youngsters (Matson, Rotatori, & Helsel, 1983) was reported as adequate in assessing the social skills of children with vision impairment in India (Sharma et al., 2000), it too was normed internationally and does not share the strong psychometric properties of the SSRS.

Finally, scales from both the SSRS and QuIEM were used to measure *both* outcome and independent variables. While different scales were used for all variables (and no total instrument scores), there is the possibility that the relationships found between variables merely reflected the lack of mutual exclusivity between the sub-scales. However, as outlined above, the rationale for choosing these instruments was based on a restricted choice of existing tools.

7.4.4 Summary

The limitations of this study are acknowledged, and the findings must be considered in the context of the variations in the sample, the size and measurement tools used. Whenever possible, measures were taken to reduce or eliminate these limitations. Strengths of this study include the longitudinal prospective design, the comparison group and the novel analysis which focused on contextual as well as disability factors. In light of these, recommendations have been drawn from the key findings of the study. The recommendations suggest ways to implement improvements in the preparation for, and provision of early education for children with vision impairment in the context of the Australian education system.

7.5 RECOMMENDATIONS

Recommendations from this study are pertinent to policy makers, principals, classroom teachers, specialists and parents. Recommendations for policy makers and educators focus on the environment and climate in which children are educated, as well as human and physical resource issues. Other recommendations relate to the preparation of children with vision impairment, and parental input into their children's development and education. The recommendations for each stakeholder group are described in the sections below.

7.5.1 Policy Makers

The following recommendations are made to government and education bodies, keeping in mind that education policies and procedures vary between Australian states and education systems.

1. Continue to support inclusion as an overarching educational policy.

Under the right circumstances, inclusion can and *does* work for children with vision impairment. However, many children are educated in less than adequate situations and experience unacceptable levels of inclusion. Inclusion requires firm and unwavering support from the education departments if it is to be an expected, typical and successful practice rather than a philosophical ideal. In this study, school ethos was low, reflecting the difficulties in implementing inclusion. A top-down attitudinal change is required among educational systems to promote a belief in, and a true enthusiasm for inclusion in schools.

2. Increase funding allocated to education programs to support inclusion.

Inclusion has resulted in an increase in variety of student needs and increased demands on teachers. In many cases it has not resulted in increased support for teachers. The teachers and principals in this study reported less than adequate levels of support. Although staff support was not a positive predictor of inclusive outcomes, a perceived lack of support places teachers under increased stress. Continuation of the current conditions may mean that teachers are unable to provide a quality educational experience for all students. It may also lead to an exodus from the teaching profession, posing risks to the sustainability of a quality teacher workforce. Increased funding is required to improve the support available to teachers to improve inclusive practices, that is to: (1) employ support personnel (to accommodate increased planning, preparation and review workloads and to assist with the behaviour management of students with diverse needs); and (2) fund more specialists to provide advice and guidance on effective ways to promote inclusion for individual students. Funding would also likely improve the school-based Environmental factors that predicted inclusive outcomes, by providing additional: (1) staff training; and (2) specialised equipment and resources for students. Given that these factors have a direct link to student inclusion, additional funding is warranted.

3. Increase inclusive education professional development opportunities for educators.

There is a critical and immediate need to up-skill teachers about inclusive education practices. Teacher training and experience with inclusion positively predicted all inclusive outcomes for children with vision impairment. However, many teachers in this study had minimal, if any training in inclusive education or vision impairment (most teachers had less than a day a year). Many of the older teachers had received none. It is likely that increased training will lead to the implementation of inclusive practice. This would lead to better student outcomes.

4. Increase the availability and allocation of specialised equipment for children with vision impairment.

Vision aides and equipment predicted successful participation, engagement and academic performance of children with vision impairment. However, children had limited access to specialised equipment and resources in this study. The amount of equipment in loan pools needs to be increased to cover the needs of all students. This requires additional funding, as well as personnel to produce the specialised resources. Streamlining procedures to access loan equipment is likely to reduce waiting times. Improvements in access to vision aides and equipment will increase the likelihood that children with vision impairment experience successful inclusive outcomes.

5. Ensure the physical design of new schools and school redevelopments meet the needs of children with sensory impairment as well as those with physical limitations.

This study demonstrated that the adequacy of the physical environment has a significant impact on participation, engagement and academic performance of children with vision impairment. Since most children with vision impairment have some residual vision, visual features such as contrast, brightness, size and lighting are critical components of classrooms, hallways, shared space and outdoor spaces. Layout and distinct tactile features are also pertinent for children with vision impairment. These physical design features can be aesthetic and functional for all children. They should be adopted as part of universal design principles in the building and redevelopment of education facilities.

7.5.2 Accreditation Bodies

1. Mandate a strong focus on inclusive education in all pre-service teacher degrees.

The inclusive education focus currently varies between Australian university teaching courses. However, it is becoming more likely that teachers will encounter students with disabilities in their classes. Many newly graduated teachers in this study had received only minimal inclusive education training, yet were expected to effectively include a student with vision impairment. Universities need to provide compulsory inclusive education units or integrate inclusive education practices and disability specific information throughout their Bachelor of education curricula. Compulsory practical experience with students with disabilities would also have a positive impact.

7.5.3 Principals

1. Take responsibility to ensure that at least six factors are adequately implemented before students with vision impairment commence early education.

A minimum of six factors increased the likelihood of successful participation, engagement, child interaction *and* academic performance for children with vision impairment. Principles need to ensure that these factors are present for their students with vision impairment. They should enforce that: (1) teachers have received adequate training required to include the child and have had prior experience with students with disabilities; (2) teachers who are positive towards inclusion are allocated students with disabilities; (3) clear strategies are in place to promote an appropriate level of adult involvement with students; (4) the physical environment has been appropriately modified in consultation with parents and specialists; (5) vision aides and equipment that have been recommended by specialists are ordered, prepared and made available; and (6) strategies are in place to promote the social skills development of children in need. Importantly, these factors need to be in place as early as possible; ideally before the commencement of early education.

2. Recruit early education teachers based on four critical characteristics: (1) prior inclusive training; (2) previous experience teaching students with disabilities; (3) positive attitude towards inclusion; and (4) awareness of appropriate involvement with students with disabilities. Allocate these teachers to classes with students with disabilities.

These characteristics predict all four aspects of inclusion for children with vision impairment. Recruitment criteria (developed by human resources staff or principals as appropriate) should consider these attributes. Allocating these teachers to students with vision impairment increases the likelihood of successful inclusion. Early experiences are critical for the future social and academic development of children; thus, providing positive early educational experiences will likely promote positive long term outcomes for children with vision impairment.

3. Build a positive school attitude towards inclusive education.

There was a discrepancy between the attitude of teachers in this study (generally positive) and the overall school attitudes (generally negative). The school philosophies towards inclusion were often not documented, unknown by staff, or unknown in the community. The implementation of such a philosophy may highlight the importance of inclusion and establish inclusion as an expectation. Principals can implement strategies to affect this attitude, for example: (1) actively support staff to engage in professional development and further learning opportunities about inclusive education; (2) provide emotional and practical support to staff that are including students with disabilities; and (3) recognise and reward efforts to promote successful inclusion.

4. Implement innovative in-school strategies to train and support teachers.

Principals can implement strategies within the school to improve the support for teachers with students who have disabilities and up-skill teachers who are interested in inclusion. (1) Establish regular 'inclusion support meetings' for staff. These could provide an opportunity for sharing of ideas, strategies and resources to promote the inclusion of students with disabilities, and increase staff perception of support. (2) Promote opportunities for interested teachers to spend time in classes with students with disabilities to develop their skills. (3) Implement class transition days so that staff can become acquainted with new students and begin planning for the new school year (this depends on prior allocation of staff and students, which is not always possible). Principals may be able to implement strategies such as these within the confines of limited funding and personnel.

5. Regulate the 'whole class' role of education assistants.

Over involvement from adults had a negative influence on the inclusion of children with vision impairment. While this study did not measure level of adult involvement by profession, some education assistants were observed to contribute to over-involvement. Previous research has indicated that this may be associated with role confusion of education assistants and classroom teachers. Principals need to ensure that education assistants support the classroom teacher by assisting with all students, not only the child with vision impairment. This enables the qualified teacher to provide educational instruction to the child with the disability and provides the child with opportunities to undertake tasks independently. Management of role demarcation can be implemented through the provision of clear job descriptions and meaningful progress reviews.

6. Encourage the creation of Individual Education Plans and reviews for all children with vision impairment demonstrating less than acceptable inclusive outcomes and/or who are at risk of poor outcomes.

Children with vision impairment who have: received early intervention, have co-existing disabilities, are from a low socio-economic background or demonstrate below average social skills are at risk of unsuccessful inclusion and require focused and dedicated attention to succeed.

7.5.4 Classroom Teachers

1. Monitor the level of involvement that adults in the classroom provide to students with vision impairment.

Teachers need to provide adequate supervision of all adults in the classroom, and enforce the importance of providing a balance of support for children with vision impairment. In addition, they should allocate the education assistant to tasks with typically developing students as well the student with vision impairment. Teachers also need to be aware of their own level of involvement with the student.

2. Implement individualised strategies.

Teachers in this study demonstrated substantial knowledge about individualisation (the strategies to modify the curriculum and instruction to suit the individual needs of the student). Teachers reported individualisation predicted the participation and engagement of children with vision impairment up to two years later. Teachers need to ensure that these individualisation strategies are implemented daily (in the classroom and elsewhere) to increase the likelihood of children with vision impairment attaining successful inclusive outcomes.

3. Ensure that recommended vision aides and equipment and are available, easily accessible, prepared and ready for use.

Vision aides and equipment influenced the participation, engagement and academic performance of children with vision impairment. However, the availability, accessibility and training were often inadequate. Teachers need to rectify this situation. Equipment and resources should be: (1) ready for use in the class, (2) up prepared in advance for use in class activities, and (3) children should be encouraged to use them. Teachers should not rely solely on large print resources when other devices and strategies have been recommended. They should demand (through liaison with visiting teacher and principal) that recommended specialised equipment is ordered or delivered to the classroom as early in the year as possible.

4. Encourage specialists to conduct interventions in the class. Cooperate with specialists to schedule activities to facilitate this.

Most children with vision impairment experienced poor quality participation and child interaction. Withdrawing children (for individual intervention) further limits their opportunities for participation and/or interaction. Teachers should encourage specialists to conduct their interventions in the class, using class activities. For the interventions to be meaningful, they need to coincide with appropriate class activities (e.g. writing activities for teaching Braille objectives). Clear communication is required: teachers and specialists need to negotiate the class schedule and visits to match appropriately. This ensures that individual objectives are addressed, while the student continues to participate in typical class activities alongside peers.

7.5.5 Specialists (Therapists and Visiting Teachers)

1. Place a stronger focus on the development of social skills for children with vision impairment – during early intervention and early education.

Social skills positively predicted all aspects of inclusion for children with vision impairment. In early intervention, allied health professionals should (a) screen social skills as part of typical developmental assessment procedures for children with vision impairment; (b) develop individualised intervention for children who demonstrate below average social skills, (c) teach parents strategies to reinforce their children's social skills, and (d) include social skills development in early intervention programs, with a particular focus on group interventions from an early age. At early education stages, social skills training based on behavioural techniques, run by specialists, and delivered to the whole class could effectively improve the social skills of children with and without vision impairment in early education. Such training should cover assertiveness, self-control and cooperation, as well as visually-based social skills concepts. This could be implemented during or outside school hours. Since social skills were such strong predictors of successful inclusion, it is likely that both groups could gain strong benefit from such intervention.

2. Advocate strongly for necessary changes to the physical environment in the class and school.

An adequate environment at the start of the year was a significant predictor of successful inclusion up to two years later. While schools were able to improve the environment throughout the year, some schools did not provide an adequate physical environment for their students with vision impairment at the beginning of the year. Specialists need to advocate strongly for environmental changes to be implemented in schools and classrooms, as early in the year as possible.

3. Continue, and increase the provision of vision impairment professional development seminars for teachers and education assistants.

Professional development sessions about the inclusive education of children with vision impairment should be continued and provided throughout the year. On-line support groups and feedback may provide an accessible alternative to face-to-face seminar attendance. Topics should address: (a) appropriate adult involvement, (b) differentiation strategies to deliver individualised curricula within class activities, (c) the importance of the physical environment and specialised equipment, (d) training in the use of specialised optical and technological equipment, and (e) aim to build a positive attitude towards inclusion of children with vision impairment.

4. Promote appropriate adult involvement with students with vision impairment.

Adult involvement was a predictor of all inclusive outcomes for children with vision impairment. Adult over-involvement was common classes, and negatively influenced student performance. Adults who are over-involved may inadvertently strengthen student dependence on adult cues and prompts. Specialists need to: (a) train staff in basic instructional methods that are designed to fade assistance and encourage students to respond to natural cues (e.g. time delay procedures), (b) model appropriate involvement through their own interaction with the student, (c) attain team agreement to clearly define the level of assistance required and accepted for each student task (e.g. in an Individual Education Plan, complete a matrix of student needs, abilities, and ways to promote independence).

5. Focus interventions to 'at risk' children

In this study, children with vision impairment that required early intervention, had additional disabilities, from low socio-economic backgrounds and with poor social skills were at risk of poor inclusive outcomes. These children require particular attention and advocacy to ensure that they achieve their highest potential. Specialists should advocate for classroom Environmental factors to be established as early as possible (and are maintained) and facilitate the development of social skills.

6. Where possible, adapt service delivery models to avoid withdrawing children with vision impairment from the classroom.

In certain instances, individual specialist interventions are required for children with vision impairment, for example, self care interventions and behaviour management issues. However, there are many instances when specialist therapy or educational interventions can be delivered in-class or via consultation rather than withdrawal. As discussed previously, this required negotiation with the classroom teacher. The involvement of a select group of typically developing peers may be an alternative strategy to deliver individualised intervention while promoting inclusion.

7.5.6 Parents

1. Make the social skills development of children with vision impairment a priority.

Given the strong influence of social skills on every aspect of inclusion for children with vision impairment, parents need to make the development of social skills a priority for their child and family, by: (a) seeking opportunities for their child to engage with other children and participate in typical life experiences from a young age; (b) demand social skills assessment and necessary interventions and strategies from specialists; and (c) consistently implement these strategies at home to promote social skills development from an early age. Relationships with parents and family are the most influential for young children; more-so than therapists, teachers and other service providers. Social skills strategies need to be reinforced and promoted in the home environment.

2. When choosing a regular early education setting to enrol children with vision impairment, consider five Environmental factors.

Parents choosing education settings should ascertain (through discussion or observation): (1) teacher attitudes towards inclusion, (2) staff training and prior experience with students with disabilities, (3) the way that adults interact with students with difficulties, (4) access to specialised equipment and aides, and (5) the willingness of the principal and teacher to modify features of the physical environment. These aspects have an important influence on the inclusive experience of children with vision impairment.

3. Where possible, provide schools and service providers with advanced notice of enrolling or changing schools.

Having sufficient notice of student enrolment gives principals and teachers a chance to prepare for the specific needs of a new student with a disability (e.g. to liaise with necessary arties, implement physical modifications, prepare resources). Positive early experiences are beneficial for children; however there is often a lag in the implementation of these strategies. Advanced notice will increase the likelihood that such strategies are put in place for the student with vision impairment.

4. Be cognisant of the competing demands of quality versus quantity of adult involvement with children with vision impairment.

Naturally, parents are concerned about their child's support needs in regular education settings. Particular concern may include the achievement of developmental objectives. Previous research suggested that some parents request a greater quantity of adult involvement to achieve these objectives. This study indicated that the quality of adult involvement may be the important factor. While over involvement from adults reduced the likelihood, a balance of involvement increased the likelihood of success. Appropriate involvement in this study comprised of allowing the child to independently conduct challenging tasks, interact, and explore their environment.

7.5.7 Further Research

The findings of this research have provided preliminary evidence about the state of inclusion for children with vision impairment in early education and the specific factors that predict successful outcomes. It is now critical that future research further evaluates these factors. Specifically, future research should:

1. investigate the longer term effect of factors on primary school and high school inclusive outcomes of students with vision impairment, and determine whether some factors become more critical in later years;
2. investigate the existence of later mediating factors on the inclusive outcomes of children with vision impairment;
3. determine whether the factors influence the inclusive success of children with disabilities other than vision impairment.
4. evaluate the effect of social skills groups on the inclusive outcomes of young children with and without vision impairment;

5. evaluate the effect of innovative training and support interventions (e.g. ‘inclusive support groups’, on-line training) on inclusive staff practices and the inclusive outcomes of children with vision impairment;
6. evaluate the effect of compulsory inclusive Bachelor of Education unit on the inclusive practice of graduate teachers and the outcomes of student with vision impairment.

7.6 CONCLUSION

Australian legislation and policy has come a long way in the past decades. Inclusive education is supported by Federal and state legislation and departmental policies. This research has demonstrated that inclusive education can work for children with vision impairment. While the majority currently experience less than acceptable inclusion, this does not have to remain the norm.

A combination of Environmental, Activity Performance and Personal factors can influence the successful inclusion of children with vision impairment in regular early education. Most of these factors are modifiable and *can* and *must* be improved to promote inclusion. The recommendations of this study described how these factors can be improved. The knowledge and tools now exist to implement the necessary factors. Action is required to ensure that inclusion becomes the expected practice and the usual practice for students with vision impairment in regular schools.

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APPENDIXES

APPENDIX A. PHASE 1 PARTICIPANT INVITATION LETTER

Dear [Parent/Therapist/Teacher/Student]

AN OPPORTUNITY TO PARTICIPATE IN A STUDY FOR YOUNG CHILDREN WITH VISION IMPAIRMENT

You and other therapists/educators/parents of/youth with vision impairment have been contacted to participate in a research project to identify factors influencing the social and academic success of children with vision impairment in school.

Your opinions and experiences are a valuable source of information. We request your help and encourage you to participate in the project.

The project involves participation in a discussion with your peers, which will take between 1 – 2 hours.

If you can help us by attending this meeting we would appreciate hearing from you. If you wish to take part in a meeting, but are unable to get to the premises, please tell us so that we can assist with transport.

- **Venue:**
- **Date and Time:**
- **Reply**: Places at this meeting is limited so if you wish to attend, please send the completed form in the stamped envelope by [date]**.** Alternatively, you may call me on [number] to reserve a place in the group.

We look forward to your participation in this important activity for families of and children with vision impairment. If you have any queries, do not hesitate to call me on [number], Manager at the Association [number] or my supervisor [name] on [number].

Yours sincerely,

[Researcher Name]

Note. Actual consumer forms printed in 14pt, 18pt Arial font, Braille, or audio cassette (determined on an individual basis by vision agencies, which have print format details for consumers and families).

APPENDIX B. RECRUITMENT ADVERTISEMENTS

B.1 Vision Agency Advertisement

AN OPPORTUNITY TO PARTICIPATE IN A STUDY FOR YOUNG CHILDREN WITH VISION IMPAIRMENT

Calling all consumers aged 13 – 20 years!!

Are you interested sharing valuable experiences about your education to help young children with vision impairment and blindness?

The Association for the Blind of WA are assisting Curtin University in a research project investigating factors that influence the early school success of children with vision impairment and blindness in mainstream schools.

This study will provide critical information for teachers, education assistants, therapists and parents to guide early intervention and early education programs for children with vision impairment in Australia.

As a student or former student, you have valuable knowledge and experience of the factors influencing these children's performance at school and we are seeking your involvement in this project.

What does it involve?
Meetings are being held students and former students with vision impairment to discuss this issue.

Each group will take between 1 – 2 hours and you will be involved in a group with your peers.

Who can participate?
Anyone aged 13-20 years who went to primary school in a regular class in WA.

When, where?
Saturday 13th November
10.30 – 12.30 pm with pizza lunch till 1pm
Association for the Blind of WA
Meet at the VCRC

How do I become involved?
For more information contact [Researcher Name] on [email address], [Manager] at the Association on [number] or [supervisor] on [number].

B.2. Online Support Group Advertisement

SEEKING STUDY PARTICIPANTS

The Association [for the Blind of WA] is helping Curtin University with a PhD research project to investigate factors that influence the early school success of children with vision impairment and blindness in mainstream schools. This study will provide critical information for everyone involved in early intervention and early education programs for children with vision impairment in Australia.

If you are a parent of a child aged 6-12 years, who has vision impairment or blindness and attends mainstream primary school we are seeking your involvement. We have had some replies, but are still seeking a few more volunteers for the group. Your experiences and views are valuable to us!

We are also seeking regular classroom teachers and education assistants who have taught children with vision impairment in Kindergarten to Grade 3 within the last three years. If you could pass this message on to current or past teachers that would be greatly appreciated.

The discussion meetings are planned as per below.

Teacher meeting: [date and time]. Relief staff reimbursement is available for schools.

Parent meeting: [date and time]. Please note, this date has changed from previous advertisements. Child minding is available in the VCRC (over 5yrs).

Venue for both: Association for the Blind, Variety Children's Resource Centre, [address].

For more information or to register your interest please contact one of the following people: [researcher] on phone [number] or email: [address], [Manager] at the Association or [supervisor] on [number].

APPENDIX C. CURTIN UNIVERSITY PHASE 1 ETHICS CLEARANCE

memorandum

Curtin
University of Technology

To	Prof. Tanya Packer, School of Occupational Therapy
From	Max Page, Executive Officer, Human Research Ethics Committee
Subject	Protocol Approval **HR 169/2004**
Date	12 October 2004
Copy	

Office of Research and Development

Human Research Ethics Committee

TELEPHONE 9266 2784
FACSIMILE 9266 3793
EMAIL s.darley@curtin.edu.au

Thank you for your application submitted to the Human Research Ethics Committee (HREC) for the project titled *"Factors influencing the social and academic success of young children with vision impairment in mainstream education in Australia: stakeholder perspectives"*.

Your application has been reviewed by members of the HREC reviewing panel who have recommended that your application be approved, hence you are authorised to commence your research as stated in your proposal. However please note that all recommendations for approval are referred to the next meeting of the HREC for ratification. In the event the Committee does not ratify the recommendation, or would like further information, you will be notified. The next meeting of the HREC is on 26/10/2004.

Approval of this project is for a period of twelve months **12/10/2004** to **11/10/2004**.

Applicants should note that it is the policy of the HREC to conduct random audits on a certain percentage of projects that have been approved. These audits may be conducted at any time following the commencement of the project. In cases where the HREC considers that there may be a risk of adverse events, or where participants may be especially vulnerable, the HREC may request the chief investigator to provide an outcomes report including information on follow up of participants.

When the project has finished or if at any time during the twelve months changes/amendments occur, or if a serious or unexpected adverse event occurs, the attached FORM B is to be completed and returned to Mrs Sinéad Darley, (Secretary, HREC) C/- Office of Research & Development as soon as possible. The approval number for your project is **HR 169/2004**. *Please quote this number in any future correspondence.*

Please find attached your protocol details together with the application form/cover sheet.

SDarley.
pp Maxwell Page
Executive Officer
Human Research Ethics Committee

Please Note: The following standard statement must be included in the information sheet to participants:
This study has been approved by the Curtin University Human Research Ethics Committee. If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth, 6845 or by telephoning 9266 2784.

APPENDIX D. PHASE 1 INFORMED CONSENT FORMS

D.1. Phase 1 Participant Information Sheet

TITLE: Predictors of successful inclusion for children with vision impairment in early education.

We are conducting a research project to identify factors influencing the social and academic success of children with vision impairment in regular schools. Cherylee Lane will undertake this as part of the requirements of her PhD programme in the School of Occupational Therapy at Curtin University. The research is being supervised by Professor Tanya Packer.

As part of this research we are conducting some groups to discuss the experience and impact of various factors on the performance of children with vision impairment in regular schools. This requires a total commitment of 2 hours of your time.

Whilst you will interact directly with others during the group, the discussion and information obtained as part of these discussions will be treated as confidential and every effort will be made to ensure you will not be identified after the group. Other organisations will at no time during the study be able to access your individual comments. All results will be described only in terms of groups, and your anonymity will be maintained throughout the reporting of the study. The Association for the Blind of WA may be provided with a summary of finding at the completion of the group discussions.

You are not obliged to participate in this study. You are able to withdraw from the study at any time without penalty. Either withdrawing from the study or declining to participate will in no way affect your relationship with the vision agencies or schools to which you are associated.

The information from the groups will form the basis for the next stage of the study (children with vision impairment will be measured against these factors identified in the groups to determine which are most important in affecting their school performance). It is anticipated that the findings of this study will result in the improvement in quality of social and academic outcomes for children with vision impairment in schools.

The finding of this study will help to improve the preparation and early education services provided to children with vision impairment and provide professionals with essential information to ensure this. If you are willing to assist would you please sign the consent form and return it in the reply paid envelope. If you feel uncomfortable signing the consent form, and would like to participate in this study we can audio tape your permission.

Thankyou for your valued time and assistance.

Note. Actual consumer forms printed in 14pt or 18pt Arial font, Braille, or audio cassette (determined on an individual basis by vision agencies, which have print format details for consumers and families).

D.2. Phase 1 Participant Consent Form

Please complete the following consent form if you agree to participate in this study. This form is available in other print, Braille and audio formats. If you do not feel comfortable signing this form we can arrange to audio tape your consent.

N.B. Parent/guardian consent is required for children less than 18 years.

See also information sheet attached

1. ____

The undersigned PLEASE PRINT

Agree to take part in the research project entitled: Predictors of successful inclusion for children with vision impairment in early education.

2. I acknowledge that I have read / been read the information sheet. I have had the project, so far as it affects me, fully explained to my satisfaction by the researcher, and my consent is freely given.

3. I have been informed that while information gained during the study may be published, I will not be identified in these publications and my personal results will not be divulged.

4. I understand that I am free to withdraw from the project at any time.

Participant name: ____

Participant Signature:____

Parent/guardian name: ____

Parent/Guardian Signature:____

(required for those under 18 years)

Date:______________

Contact address:____

Contact Phone Number: ____________________

Thankyou for your cooperation!

This study has been approved by the Curtin University Human Ethics Committee. If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth 6845 or by telephoning (08) 9266 2784.

Note, Actual consumer forms printed in 14pt, 18pt Arial font, Braille, or audio cassette (determined on an individual basis by vision agencies, which have print format details for consumers and families).

APPENDIX E. NOMINAL GROUP PARTICIPANT WORKSHEET

Please wait for instructions from the facilitator.

Question 1

What are the important factors influencing the participation, engagement, social and academic performance of children with vision impairment in early regular education?

Note. Actual consumer forms printed in 14pt or 18pt Arial font, Braille, or audio cassette (determined on an individual basis by vision agencies, which have print format details for consumers and families).

APPENDIX F. NOMINAL GROUP TECHNIQUE PROTOCOL

Meeting
Venue: [venue]
Duration: 2 hr session (maximum)
Group size: 5-8 people per group
No of groups: minimum of 5 including:
visiting teachers; regular teachers and education assistants; allied health professionals; individuals with vision impairment; parents (use different coloured cards for each session).
Independent trained observer present to monitor process for internal validity.

Introduction and Background

1. Welcome, tea, coffee
2. Introductions
3. Background and Purpose of the Meeting

Purpose

The purpose of this meeting is to collect information about the issues influencing the performance of young children with vision impairment and blindness in early mainstream education in Australia.

Background

Inclusive education for children with disabilities is acknowledged as an important practice which promotes developmental outcomes for children with and without disabilities alike.

Concerns do exist among some parents, teachers and authors regarding the social and curricular inclusion of these children. Most research of inclusive schools does not involve children with vision impairment, so there's little professional literature to guide what best promotes the school performance for these students.

Purpose of this group

Five meetings are being conducted as the first stage of this study. The groups will be held with teachers, health professionals, students and parents. Each group will generate a list of factors which they think positively or negatively influence the school performance of children with vision impairment.

These factors will go on to form the basis for the next stage of the study. In the second stage, children with vision impairment will be assessed against the factors generated in your groups to determine which are most important over one and two years of schooling.

Input from all of the groups and members are important. Each of you provides a range of experiences – from people who teach and support children with vision impairment through the school process to those who have experienced schooling first hand. All of your experiences are relevant and welcome.

You're providing information, but may also pick up ideas and ways of approaching inclusion from discussion with others.

Ground Rules

- Information collected is confidential
- Say what you think, we welcome varying opinions
- All opinions are valued and will be noted
- There'll be some periods of writing on your own, and some time involved in group discussion and prioritising. Please follow instructions during these periods.
- Also, please indicate if you wish to hear opinions on a particular issue during the discussion.
- Are there any questions?

Definitions

- *Regular/ mainstream schooling:* Being enrolled in and participating in a regular class in a regular school. This does not include children who attend specialised Education Support Units, Centres or Schools for children with disabilities or vision impairment.
- *Vision Impairment:* includes impairment ranging from low vision, legal blindness through to total blindness. Vision loss that is severe enough to impede performance of vocational, recreational and/or social tasks… and cannot be corrected to normal vision by regular eyeglasses or spectacles. A person who cannot see at six metres what a normally sighted person can see at 18 metres, or has a field of vision 20 degrees or less, (a normal field of vision is 180 degrees) is considered to have moderate vision impairment. A person who is totally blind has no vision at all.
- *School inclusive success:* based on social interaction, participation, engagement and academic performance
  Social interaction: Interacting with and being accepted by and making friends with other children in the class, being involved in social playground activities and social activities outside of school.
  Participation Performance: being assigned to or involved in classroom and playground group activities rather than by oneself.
  Engagement: being involved in activity.
  Academic Performance: Level of reading, writing, arithmetic performance, understanding concepts and achieving curriculum outcomes.
- *Students in focus:* children in early education – that is: kindergarten, pre-primary or grade 1 with vision impairment enrolled full-time in regular classrooms.

Step 1. Silent generation of ideas in writing.
FACILITATOR:
The question of focus for our meeting is: What are the important factors influencing the social, participatory and academic performance of children with vision impairment in early mainstream education in Australia?

I'd like each of you to take five minutes to list your ideas in response to this question, in a brief phrase or a few words, on the worksheet in front of you.

If you could please work independently at this stage to identifying factors which you anticipate are important for these children's performance. I ask that you don't talk with other members or look at their work-sheets, so each of us can prepare our own contributions to the meeting.

At the end of the five minutes, I'll suggest how we can proceed to share our ideas. Are there any questions? Let's proceed…

Step 2. Round-robin recording of ideas on flip-pad

- Going around the table, facilitator asks for one idea from each member at a time.
- Facilitator writes the idea of a group member on the flip chart then proceeds to ask for one idea from the next member in turn.
- Once an answer is received from everyone in the room, the process goes around a second and third time to ask if anyone has any extra answers they want recorded. No interruption is allowed during this process and answers are recorded without query or comment.
- Members may pass at any time if they have nothing to add, or re-enter later.

FACILITATOR:
"During the last five minutes, each of us has listed important factors influencing the performance of children with vision impairment. Now I would like to have each of you to share your ideas with the other members of the group.

This is an important step because our list of ideas will constitute a guide for further discussion and stimulate additional ideas.

So we can accomplish this goal as efficiently as possible, I'll go around the table and ask individuals, one at a time, to give me one idea from your worksheet, summarised in a brief phrase or a few words. After the entire list is on the board, we'll have the opportunity to discuss, clarify, and dispute the ideas.

You don't need to repeat an idea if someone has already suggested it, however if your idea has a different emphasis or variation, we certainly welcome that. You can pass if you don't have another suggestion and re-enter the discussion if you come up with another idea…..[First person], would you give me one idea from your list?"

Step 3. Serial group discussion of each item

- Each idea listed on the flip chart is selected in order and a short period of time is allowed for the discussion of each idea.
- Facilitator points to the item, reads it aloud and asks the group if there are any questions, statements of clarification, or statements of agreement or disagreement which members would like to make about it.
- The leader allows for discussion and then moves the group on to following items.

FACILITATOR:
Now that we've listed our ideas on the flip chart, we'll take time to go back and briefly discuss each idea. The purpose of this discussion is to clarify the meaning of each item on our flip chart for our group. It's also our opportunity to express our understanding of the logic behind the idea, and the relative importance of the item. We should feel free to express varying points of view or to disagree.

We will, however want to pace ourselves so that each of the items on the chart receives the opportunity for some attention, so sometimes I may ask the group to move on to further items. Finally, let me point out that the author of the item doesn't need to feel obliged to clarify or explain an item. Any member of the group can play that role. Are there any questions or comments group members would like to make about Item 1?

Step 4. Voting by each member

- Group members select from the entire list of ideas on the flip chart a specific number of most important items individually.

FACILITATOR:
Now that we've clarified the meaning of each idea, I'd like to have judgement of each group member concerning the most important ideas on the list.

To accomplish this step I'd like you each to take 5 (to 8) index cards (Table F1). Now select the five most important items from our list of [*number of items*]. This will require careful thought on your part. As you look at the flip chart and find an item which you feel is very important, please record the item on an index card.
I'll show you how to record the item. Place the number of the item in the upper left-hand corner. For example, if you feel Item 9 is very important, you'd write 9 in the upper left-hand corner (Facilitator illustrates this on drawing on flip chart). Do this for each of the five most important items from our list. Then write the identifying word or phrase on the card *(Demonstrate).*

When you've completed this task, you should have five cards, each with a separate phrase written on the card, and with identifying numbers using the numbering system from our list of ideas on the flip chart. Don't rank-order the cards yet. Spend the next few minutes carefully selecting the five cards. We'll all rank-order the cards together. Are there any questions?

- The members individually rank-order their choices onto 5-8 coloured cards. Five or more cards are desirable for research purposes or where lists are longer than 12 (8 suggested for 20 items) (Table F1) (Mason, 1999).

FACILITATOR:
Please spread out your cards in front of you so you can see all five (to 8) at once. Looking at your set of five cards, decide which one card is the most important. Which card is more important than the other four cards? Give time. Write a number 5 in the lower right-hand corner of the card and underline the number three times. Turn that card over and look at the remaining four cards.

Of the remaining four cards, which is the least important? Write a number 1 in the lower right-hand corner and underline that number three times. Now turn that card over.

Of the three cards you have left, choose the most important of the remaining cards. Write the number 4 in the lower right hand corner and underline that 3 times. Turn the card over.

Now choose the least important of the two remaining cards and write the number 2 in the lower right hand corner, underlining the number 3 times. Lastly, write the number 3 in the lower right hand corner of the last remaining card and underline that number 3 times.

Table F1. Number of votes required by NGT group number

Importance	Rank # assigned to each vote			
	No. group participants			
	5	6	7	8
Most important	5	6	7	8
Least important	1	1	1	1
Next most important	4	5	6	7
Next least important	2	2	2	2
Next most important	3	4	5	6
Next least important		3	3	3
Next most important			4	5
Next least important				4

Step 5: Vote tallying, ranking by facilitator and discuss results with group

- Cards are collected from members.
- The ranked number allocated to each item by each member is recorded next to the item.
- Totalled for each item.
- Items are ranked from highest to lowest score and most to least participant votes.
- Discuss results with group.

APPENDIX G. NOMINAL GROUP OBSERVER CHECKLIST

Date: ______________ Group: ____________ No participants:_____

Facilitator: ______________________ Observer:_______________________

Component	Covered?		Comments
	Yes	No	
All participants have been provided with Information Sheet?			
Consent obtained from all participants?			
Materials adequate? • Flip-chart/paper • Writing equipment • Participant worksheets • Voting cards • Appropriate participant seating with view of flip-chart/paper			
Appropriate modifications made for participants with disabilities. e.g. assistants			
Introductions and welcome made?			
Meeting purpose explained?			
Ground rules covered clearly?			
Definitions provided			
Question described?			
Protocol followed? • Silent generation of ideas • Round-robin recording of ideas • Serial discussion • Vote on item importance			
Opinions/views from individuals encouraged and valued by facilitator?			
Voting procedure clearly described to participants?			
Votes tallied correctly?			
Results conveyed to group?			
Reimbursement for travel or relief staff arranged as required?			
Total			

APPENDIX H . PHASE 1 DEMOGRAPHIC QUESTIONNAIRES

H.1 Professional Demographic Questionnaire

Date:_______________ Age:________________ Sex:_______________

1. Role: Please indicate

- ☐ Itinerant Teacher
- ☐ Regular classroom teacher
- ☐ Education assistant
- ☐ Therapist or Allied Health Professional

2. Number of years in this role:____

3. Number of years experience with children with vision impairment:___________

4. What age and/or school level of children do you work with?__________

5. Please indicate the number of children with vision impairment you have experience providing services to:

- ☐ 1
- ☐ 2-4
- ☐ 5-10
- ☐ more than 10

6. Please indicate the level of vision impairment of the children to whom you have provided services:

- ☐ Low vision (> 6/60 visual acuity)
- ☐ Severe vision impairment (<6/60 visual acuity or <20 degrees field)
- ☐ Totally blind (no sight)

7. What training have you received regarding providing services to children with vision impairment?____

____

H.2 Student Demographic Questionnaire

Date:______________

Age:______________

Gender:____________

1. What grades did you attend mainstream schooling (in a regular class)?

____

2. During what years did you attend mainstream schooling (e.g.: 1990-1998)?

____

3. Visual acuity: Do you know what your level of vision is?

Left eye:________________________

Right eye:_______________________

4. Do you know what your vision condition is? Please state.

____

5. At what age were you diagnosed with vision impairment?

____

Please hand completed form to facilitator.
Thank you for your cooperation!

Note. Actual consumer forms printed in 14pt, 18pt Arial font, Braille, or audio cassette (determined on an individual basis by vision agencies, which have print format details for consumers and families).

H.3 Parent Demographic Questionnaire

Date:_____________

Your age:__________

Your sex:__________

The following questions refer to your child with vision impairment or blindness:

1. Child's age: ____________

2. Child's sex:____________

3. Child's current school level:_______________________

4. Did your child attend school in a mainstream classroom (i.e. a regular classroom)?

____

5. Grades your child attended mainstream schooling (in a regular class):________

6. Years your child has attended mainstream schooling (e.g.: 1998..)___________

____

7. Visual acuity: Do you know what your child's level of vision is?

Please state.

Left eye:_________________

Right eye:________________

8. What is your child's vision condition? _____________________________

9. At what age was your child diagnosed with vision impairment?__________

10. Does your child have any other significant disabilities? Please state:

____

Please hand completed form to facilitator.
Thank you for your cooperation!

Note. Actual consumer forms printed in 14pt, 18pt Arial font, Braille, or audio cassette (determined on an individual basis by vision agencies, which have print format details for consumers and families).

Appendix I. NGT RESULTS BY STAKEHOLDER GROUP

Table I1. Allied health professionals NGT results

Rank code	Item	Rank criteria: Vote sum	Rank criteria: No. members voting
#1	Parental qualities: expectations and values of parents, cultural background, education level, assertiveness/ empowerment or aggressiveness to ask for needs.	42	6
#2	Extent of vision impairment and functional impact of the impairment.	33	7
#3	Level of early intervention or early education provided.	29	5
#4	Child's personality factors: extroverted vs. introverted, ability to make friends, confidence, coping strategies, specific inherent abilities of child and pattern of strengths and weaknesses.	27	6
#5	School attitude: principal, staff, community attitude towards inclusion, disability and principal support of staff and others.	25	5
#6	Presence of other physical and /or intellectual disabilities.	19	4
#7	Training of class teachers to do with disability and inclusive education and working in a team (initial).	19	3
#8	Resources for the chid: accessibility of classroom resources, especially adapted equipment.	15	4
#9	School readiness skills: fine motor, sitting in a group, language, communication.	10	5
#10a	Age of onset of vision impairment.	7	2
#10b	Other family issues/stressors and impact of these.	7	2
#10c	Appropriate assessment and provision of learning modes: e.g. Braille vs. large print vs. use of aids.	7	2
#11	Availability of support staff (e.g. visiting teacher and education assistant) and resources in class for the teacher.	6	2
#12a	Classroom programming and extent it is targeted towards child's interest and knowledge base.	3	1
#12b	Basic information available to parents and their knowledge of education system.	3	1
#13	Physical school environment: accessibility, lighting, safety, size of class/student numbers.	1	1

Note. #*k* = ranking with lower numbers indicating higher ranking; a, b & c distinguishes items with the same ranking.

Table I2. Visiting teachers NGT results

Rank code	Item	Rank criteria: Vote sum	Rank criteria: No. members voting
#1	Early intervention (educational or therapy as appropriate) as early as possible up to 3 years of age.	35	5
#2	Provision of appropriate aids (including vision aids and others), training the student in use of these aids, availability of the aids and acceptance of the aids by the child, teacher and peers in the class.	17	4
#3a	Availability of support for the family and child, opportunity to meet other parents and children with vision impairment, family acceptance of the vision impairment.	14	2
#3b	Ongoing professional development for teachers, staff, parents e.g. Braille workshops, updated best practice or research base.	14	2
#4	Having realistic expectations from parent, teacher, student.	11	2
#5	Personality of the child, i.e. extrovert vs. introvert.	10	2
#6	Classroom teachers' knowledge of inclusive strategies (e.g. call child by their name, sufficient time, physical placement of the child in the classroom).	9	3
#7	Willingness of classroom teacher to adapt and include student.	9	2
#8	Child's level of vision.	8	1
#9	Parental involvement in learning and decision making.	7	1
#10	Educating peers how to interact with the child.	7	2
#11a	Concept development of the child, social skills, communication and language skills.	6	2
#11b	Positive attitude of the child towards learning and of the teacher towards teaching the child.	6	2
#12a	Provision of material in appropriate media and at the same time as peers.	5	1
#12b	Amount of hands on experience the child has had: physical, real objects, real life experiences.	5	1

(table continues)

Table I2. ***(continued)***

Rank code	Item	Rank criteria	
		Vote sum	No. members voting
#13	Level of input from visiting teachers (time).	3	1
#14a	Family background: position in family, English speaking, cultural, links to expectations, other members with vision impairment in the family, education level of parents.	2	1
#14b	Training level of support staff (visiting teachers) in education and vision issues.	2	1
#14c	Orientation and mobility skills and independent living skills.	2	1
#15a	Physical appearance of child and blindisms, willingness or ability to change.	1	1
#15b	Funding: departmental and school.	1	1
#15c	Student misinterpreting social cues such as body language, facial expression.	1	1

Note. #*k* = ranking with lower numbers indicating higher ranking; a, b & c distinguishes items with the same ranking.

Table I3. Teacher NGT results

Rank code	Item	Rank criteria	
		Vote sum	No. members voting
#1	Treating the child with vision impairment the same as other students (whilst still aware of the disability) e.g. same rewards (perhaps modified to be suitable), behaviour modification, expectations as others in the class.	11	3
#2a	Early socialisation and exposure to groups (e.g. playgroups, pre-primary). Family need to be involved and prepared to encourage this.	5	1
#2b	Allow child to make mistakes and describe that others make mistakes.	5	1
#3a	Principal and teacher attitude – accepting of students with vision impairment / organised / educated about their needs as well as positive attitude	4	2
#3b	Level of staff assistance. Avoid over-protecting the child with vision impairment or doing too much for them e.g. encourage independence, encourage others to speak directly to the child, not through staff.	4	2
#3c	Resources – adequate, appropriate, up-to-date, readily accessible (time wise) e.g. Braille and picture books.	4	2
#4a	Sharing adapted and accessible resources, equipment and facilities for all children with and without vision impairment e.g. Braille cards, picture books, climbing equipment.	4	1
#4b	Assistants need to know in advance what the activities will be so that materials can be prepared and adapted in advance.	4	1
#5	Verbal Instruction – verbal expression, description, use of voice tone rather than visual cues.	3	1
#6	Appropriate programming – plan independent activities for child with vision impairment when lessons are not relevant (e.g.: writing)	1	1

Note. #k, = ranking with lower numbers indicating higher ranking; a, b & c distinguishes items with the same ranking.

Table I4. Student NGT results

Rank code	Item	Rank criteria	
		Vote sum	No. members voting
#1	Parental involvement and support at home: being involved in school, knowing what is happening, home tutoring	19	3
#2a	Awareness by teachers and other staff about the child with vision impairment.	16	3
#2b	Adequate assistance for the child – teacher aids, technology, materials to be used, magnifiers.	16	3
#3	The way/mode of teacher's communication and teaching in the class e.g. writing instead of verbalising.	13	2
#4	Adaptation of activities appropriately rather than saying this is too hard to change, willingness of teacher to attempt.	12	2
#5	Presenting education using other means rather than visual only e.g. tactile, audio.	11	3
#6	Teacher preparation: teachers making sure that activities are ready before class, e.g. information on a disc/USB.	11	2
#7	Adequate support for the teacher: access to information and training and service providers (vision education, aids, Association for Blind.	10	2
#8	Ability to locate friends for play activities.	8	2
#9	Biased or negative views and perceptions of teachers towards the student with vision impairment, e.g. they can't do that or they're not trying.	8	1
#10	Appropriate level assistance: willingness of teachers to help without taking over.	7	2
#11	Appropriate programming of activities: emphasis on activities such as art/craft during early education may be isolating; use of other activities instead.	5	1

(table continues)

Table I4. ***(continued)***

Rank code	Item	Rank criteria: Vote sum	Rank criteria: No. members voting
#12	Attitude of other kids: they may not take the child seriously; bullying.	3	2
#13	Accessibility of physical layout of the school e.g. playground, classroom.	3	1
#14	Participating in sporting activities: need to adapt for kids to participate.	2	1
#15a	Showing the child the experience that other children are involved in.	1	1
#15b	Inclusive education practices	1	1

Note. #k= ranking with lower numbers indicating higher ranking; a, b & c distinguishes items with the same ranking.

Table I5. Parents NGT results

Rank code	Item	Rank criteria: Vote sum	Rank criteria: No. members voting
#1	Inclusive and approachable attitude from all staff and teachers.	11	4
#2	Support for teachers in mainstream schools and presence of an Education Assistant.	9	3
#3	Child's self-confidence, self-esteem, knowing how to say no or deal with peer pressure, knowing their limitations and being able to speak up to ask for what they need e.g. with teachers.	8	2
#4	Parental input into the child's development.	7	2
#5	Appropriate and practical equipment and resources so the child is able to and wants/ is inclined to use them.	5	2
#6	Early intervention strategies or stimulation opportunities.	5	1
#7a	Extra outside help e.g. home or school tutoring after school.	4	1
#7b	Training for teachers regarding specific knowledge about vision impairment, inclusive strategies to encourage participation.	4	1
#8a	Level of emotional sensitivity, and environmental stimulation.	2	1
#8b	Appropriate modifications made in the class.	2	1
#8c	Involvement in extra-curricular activities, sports (not just education) and social interests.	2	1
#9	Diet factors.	1	1

Note. *#k* = ranking with lower numbers indicating higher ranking. a, b & c distinguishes items with the same ranking.

APPENDIX J. PARENT OF CHILD WITH VISION IMPAIRMENT RECRUITMENT FORMS

J.1. Parent Invitation

Dear Parent,

AN OPPORTUNITY TO PARTICIPATE IN A STUDY FOR YOUNG CHILDREN WITH VISION IMPAIRMENT

Australian families with a child with vision impairment or blindness aged between 3 and 6 in mainstream early education during [2005 or 2006] have been contacted to participate in a Curtin University study. The [Association for the Blind of WA/ Royal Victorian Institute for the Blind/ Royal Foundation for the Blind] is supporting this research investigating factors influencing the social and academic success of children with vision impairment in school.

Your opinions and experiences are a valuable source of information. We request your help and encourage you to participate in the study.

Past research has identified general factors that contribute to the successful school inclusion of children with disabilities. Research is now focussed on understanding specific factors unique to children and families with vision impairment. My study is designed to help you, your child and the people who teach your child.

As a parent, you have valuable knowledge of your child's abilities. This project is designed to involve you in completing two questionnaires about your child and your family.

To add to this information we would like to approach your child's principal and teacher with an interview and questionnaire. We are also requesting your permission to observe your child in his or her classroom, participating in academic and social classroom activities (see information letter). The results from the interviews, observations and questionnaires will be used to produce information to help with early intervention and school programs.

I am seeking as many families as possible to join this project. If you are able to participate or have any queries, please contact me before [date] via telephone [number], e-mail [email address], or call my supervisor [name].

Thank you for your time and assistance.

[Researcher Name]

Note. Actual consumer forms printed in 14pt or 18pt Arial font, Braille, or audio cassette (determined on an individual basis by vision agencies, which have print format details for consumers and families).

J.2 Parent Information Sheet

TITLE: Predictors of successful inclusion for children with vision impairment in early education.

We are currently conducting a research project to identify factors influencing the social and academic success of children with vision impairment and blindness in regular schools. Cherylee Lane will undertake this research as part of the requirements of her PhD program in the School of Occupational Therapy at Curtin University, WA. The research is supervised by Professor Tanya Packer.

As part of this research we are collecting information from three different groups: (1) parents of children with and without vision impairment, (2) teachers of children with vision impairment and (3) children with and without vision impairment themselves.

Participating in this study involves four things from you. These are:

1. Completing a questionnaire
These will provide valuable data on:
- General family and child demographic information.
- Parent ratings on children's skills

2. Completing follow-up questionnaires in Term 4 2005 [&/or] 2006
This will demonstrate the changes your child has made over the year.

3. Providing consent for me to contact your child's school and teacher
Questionnaires and interviews will be conducted with your child's teacher to provide information on:
- The school attitudes and ability to include a child with vision impairment.
- Classroom, social and academic skills of children with vision impairment.
- General demographic information.

4. Providing consent to participate and for your child to be observed in his or her school
Observing your child interacting in the classroom will demonstrate:
- Participation in academic and social classroom activities. Observations will be over one day in your child's classroom in Term 1 and 4, [2005 or 2006] [and Term 4, 2006]. I will conduct the observations personally (with an assistant) and will not interrupt the usual classroom schedule.

All information obtained as part of these questionnaires and observations will be treated as confidential, securely stored and you will not be identified in any reports. No vision or education agency will be able to access your individual comments during the study. All results will be described only in terms of groups, and you and your child's anonymity will be maintained throughout the study.

You are not obliged to participate in this study. You are able to withdraw from the study at any time without penalty. Either withdrawing from the study or declining to participate will in no way affect your relationship with any vision or education agency you are involved with.

Information from this research will be presented in the form of a thesis and may be published in a scholarly journal or report to service providers and consumers. It is anticipated that the findings of this study will result in the improvement in quality of social and academic outcomes for children with vision impairment.

The finding of this study will help to improve the preparation and early education services provided to children with vision impairment and provide professionals with essential information to ensure this. If you are willing to assist would you please contact me as soon as possible on [number] or email: [address] before [date]. Please send completed forms in envelopes provided.

Yours sincerely,

[Researcher Name]

Thankyou for your valued time and assistance!

This study has been approved by the Curtin University Human Ethics Committee. If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth 6845 or by telephoning (08) 9266 2784.

Note. Actual consumer forms printed in 14pt, 18pt Arial font, Braille, or audio cassette (determined on an individual basis by vision agencies, which have print format details for consumers and families).

J.3 Parent consent form

Please complete the following consent form if you agree to participate in this study. This form is available in Braille and audio formats. If you do not feel comfortable signing this form we can arrange to audio tape your consent.

Parent/guardian consent is required for children under 18 years.

This form is also available in other formats if required.

See also information sheet attached

1. ____

The undersigned PLEASE PRINT

Agree to take part in the research project entitled: Predictors of successful inclusion for children with vision impairment in early education.

2. I acknowledge that I have read / been read the information sheet. I have had the project, so far as it affects me, fully explained to my satisfaction by the researcher, and my consent is freely given.

3. I have been informed that while information gained during the study may be published, I will not be identified in these publications and my personal results will not be divulged.

4. I understand that I am free to withdraw from the project at any time.

Parent/ guardian Signature:____________________ Date:________________

Parent/guardian name: ____

Name of your child with vision impairment or blindness:____________________

Child's date of birth: __________________Child's gender:________________

Child's school level in [2005 or 2006]: ______________________________

Home address:____

Contact Phone Number: ____

Thank you for your cooperation. We will contact you with observation dates

This study has been approved by the Curtin University Human Ethics Committee. If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth 6845 or by telephoning (08) 9266 2784.

We would like to complement information provided by you with information from your child's teacher. Please complete the following form to give your permission to approach your child's school principal and school teacher (or potential teacher) to request their participation in the research. Their involvement includes completing of questionnaires and interviews and having observations in their classrooms.

This form is also available in other formats if required.

This is to authorise permission for [Researcher Name] (Curtin University of Technology) to contact the principal and teacher below for the study of *Predictors of successful inclusion for children with vision impairment in early education.*

_______ I / we consent to our child's school principal and teacher being contact to request his/her participation in this research.

Parent's Name____

Parent's Signature____

Date ____________________

Name of your child with vision impairment or blindness ______________________

Child's date of birth: ________________________

Child's school grade in [2005 or 2006]: _______________

School your child will attend in [2005 or 2006]: __________________________

School address: ____

School contact phone number____

Name of the school's principal (if known) ______________________________
(First name) (Surname)

Name of your child's [2005 or 2006] classroom teacher (if known) ____________
(First name) (Surname)

Thank you for your cooperation

This study has been approved by the Curtin University Human Ethics Committee. If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth 6845 or by telephoning (08) 9266 2784.

Note. Actual consumer forms printed in 14pt, 18pt Arial font, Braille, or audio cassette (determined on an individual basis by vision agencies, which have print format details for consumers and families).

APPENDIX K. PRINCIPAL RECRUITMENT FORMS

K.1 Principal Invitation Letter

Dear Principal,

I am seeking your approval for [School] involvement in a Curtin University of Technology, Western Australia research project.

The research is primarily designed to investigate the way child, classroom, and personal factors affect the social and academic performance of children with vision impairment in mainstream classrooms. Results from this research may assist in the preparation and provision of effective and inclusive education for these children in mainstream preschool and primary schools in Australia.

[Child's name] currently attends your school/program and has vision impairment. [Child's name] is participating in our research and has given her approval for [Child's name]'s [2005 or 2006] teacher to be approached regarding his/her child, and also for [Child's name] to be observed in the classroom. Please see the attached form. [Parent name] is investing time to complete a questionnaire about [Child's name] and their family, however to gain a complete profile we also require information from yourself, [Child name]'s [2005 or 2006] teacher and an observation of [Child's name] in her classroom.

Specifically, I am seeking:

1. **Your approval to approach [Child's Teacher]** to request a total of 5 hours of his/her time (during Term 1 and Term 4, [2005 or 2006]). Her involvement will consist of participating in interviews and completing questionnaires.
2. **Permission to observe [Child name]** and two classmates in their classroom at [School] to evaluate their social and classroom performance. This will take 1 day during Terms 1 and 4 [2005 or 2006] at the teacher's convenience.
3. **Your participation** in a 20 minute interview about the school's goals and values.

As mentioned, this study also involves two typically performing classmates, which requires additional parental consent. Their details are confidential and I am not privy to them. In order to obtain parental consent, I will request [Child's teacher] to forward an information letter to the families of potential participants in her [2005 or 2006] class.

Obtaining this information will enable a majority of the study to be completed. The final stage involves follow-up data collection of the children and school in Term 4, 2006 (additional teacher consent will be obtained for this stage).

It would be greatly appreciated if you would complete the attached form and return it to Curtin University of Technology so that I may approach [Child's Teacher] regarding this research. If you have any questions please call me on [number], email [address] or contact my supervisor [name] on [number].

Thank you for considering this proposal.

K.2 Principal Information Sheet

TITLE: Predictors of successful inclusion for children with vision impairment in early education.

We are currently conducting a research project to identify factors influencing the social and academic success of children with vision impairment in regular schools. Cherylee Lane will undertake this research as part of the requirements of her Ph.D. programme in the School of Occupational Therapy at Curtin University, WA. The research will be supervised by Professor Tanya Packer.

As part of this research we are collecting information from three different groups: (1) parents of children with and without vision impairment, (2) principals and teachers of children with vision impairment and (3) children with and without vision impairment themselves.

Participating in this study involves three major actions from you. These are:

1. **Your approval to approach [Child's name]** [year] teacher to request a total of 5 hours of his/her time (during Term 1 and Term 4, [2005 or 2006]). His/her involvement will consist of participating in interviews regarding inclusive education, reviewing goals/IEP and completing questionnaires rating the child with vision impairment and two classmate's classroom, social and academic skills.
2. **Permission to observe [Child's name]** and two of her classmates in their classroom at [School] to evaluate their social and academic performance. This will take a total of two days during both Term 1 and 4, [2005 or 2006] at the teacher's convenience [then in Term 4, 2006]. Parent permission will be obtained prior. The observations will be conducted by the researcher.
3. **Your participation** in a 20 minute interview regarding school goals and values

All information obtained as part of these questionnaires and observations will be treated as confidential, securely stored and you will not be identified in any way. No vision or education agency will be able to access your individual comments during the study. All results will be described only in terms of groups, and you and your child's anonymity will be maintained throughout the study.

You are not obliged to participate in this study. You are able to withdraw from the study at any time without penalty. Either withdrawing from the study or declining to participate will in no way affect your relationship with any vision or education agency you are involved with. Information from this research will be presented in a thesis and may be published in a scholarly journals or reports for service providers and consumers. It is anticipated that the findings of this study will result in the improvement in quality of outcomes for children with vision impairment in schools.

It is anticipated that the findings of this study will result in the improvement in quality of social and academic outcomes for children with vision impairment in schools and provide professionals with essential information to ensure this. If you are willing to assist would you please sign the consent form and return it in the reply paid envelope.

K.3 Principal consent form

Please complete the following consent form if you agree to participate in this study.

This form is also available in alternative to print formats if required.

See also information sheet attached

1. ____

The undersigned PLEASE PRINT

Agree to take part in the research project entitled: Predictors of successful inclusion for children with vision impairment in early education.

I authorise school participation, approval for the researcher to contact [Child's name] [2005 or 2006] teacher regarding participation and consent to observation of [child with vision impairment] and two peers in the school as part of this research project.

2. I acknowledge that I have read / been read the information sheet. I have had the project, so far as it affects me, fully explained to my satisfaction by the researcher, and my consent is freely given.
3. I have been informed that while information gained during the study may be published, I will not be identified in these publications and my personal results will not be divulged. Likewise, the name and identifying details of the School will not be disclosed.
4. I understand that I am free to withdraw from the project at any time.

Principal Signature: ________________________ Date:__________________

Principal Name:____

School Name: ____

School Address: ____

Participating Child's Name:____

Child [2005 or 2006] Teacher's Name: ____________________________________

Thank you for your cooperation

This study has been approved by the Curtin University Human Ethics Committee. If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of technology, GPO Box U1987, Perth 6845 or by telephoning (08) 9266 2784.

APPENDIX L. TEACHER RECRUITMENT FORMS

L.1 Teacher Invitation Letter

Dear [Teacher],

A short time age I wrote to your school principal regarding participation in a Curtin University study titled: *Predictors of successful inclusion for children with vision impairment in early education.* Your principal agreed to participate and approved of us approaching you to request your participation.

[Child's name] is currently enrolled in your [2005 or 2006] class and has vision impairment. Her mother, [Parent's name] is participating in our research and has given her approval for you to be approached regarding [Child's name]. [Parent's name] has also given permission for [Child's name] to be observed in your class if you participate. [Parent's name] is investing time to complete a range of questionnaires about [Child's name] and her family; however to gain a complete profile we also require information from you.

The research is primarily designed to investigate the way child, school, and personal factors affect the social and academic performance of children with vision impairment in mainstream classrooms. Results from this research may assist in the preparation and effective inclusive education of these children in mainstream schools throughout Australia.

The part of the research involving you takes place over 1 day in both Term 1 and Term 4, [2005 or 2006]. It involves: completing questionnaires, participating in an interview and allowing the researcher to observe [Child's name] and two classmates in your classroom (see Information Sheet). Obtaining this information will enable the majority of the study to be completed. All information will be treated in the strictest of confidentiality, and data will be coded to ensure it is not identifiable.

As mentioned, this study also requires two of [Child's name]'s typically performing classmates to be involved. Parental consent is required for the participation of these classmates. Their details are confidential and I am not privy to such information. In order to obtain parental consent for this study, I request that you contact these families by forwarding letters (please see information attached).

I'd greatly appreciate if you would contact me on [number] to register your involvement. Alternatively you may return the consent form to Curtin University and I will contact you for further information. If you have any questions please call me or contact my supervisor [name] on [number]. We are happy to discuss this project further should you wish to do so.

Thank you for considering this request.

Yours sincerely,

[Researcher Name]

L.2 Teacher Information Sheet

TITLE: Predictors of successful inclusion for children with vision impairment in early education

We are currently conducting a research project to identify factors influencing the social and academic success of children with vision impairment in regular schools. Cherylee Lane will undertake this research as part of the requirements of her PhD program in the School of Occupational Therapy at Curtin University, WA. The research will be supervised by [Supervisor Name].

As part of this research we are collecting information from three different groups: (1) parents of children with and without vision impairment, (2) principals and teachers of children with vision impairment and (3) children with and without vision impairment themselves.

The part of the research involving you takes place over 1 day in both Term 1 and Term 4, [2005or 2006]. It involves:

1. **Completing 3 Questionnaires** regarding [Child's name] and two typically performing classmates, classroom, social and academic skills and school demographics.
2. **Participating in an interview regarding** the inclusiveness of the classroom, your views and experience of teaching a child with vision impairment.
3. **Observations of [Child's name] and two classmates in your_classroom** by the researcher, regarding student's participation in social and academic activities. None of the children will be singled out, nor will the research interrupt class proceedings.

All information obtained as part of these questionnaires and observations will be treated as confidential and you will not be identified in any way. No vision or education agency will be able to access your individual comments. All results will be described only in terms of groups, and you and your student's anonymity will be maintained throughout the study. The Association for the Blind of W.A. may be provided with a summary of findings at the completion of the study.

You are not obliged to participate in this study. You are able to withdraw from the study at any time without penalty. Either withdrawing from the study or declining to participate will in no way affect your relationship with any vision or education agency you are involved with.

Information from this research will be presented in the form of a thesis and may be published in a scholarly journal or information document for service providers and consumers. It is anticipated that the findings of this study will result in the improvement in quality of social and academic outcomes for children with vision impairment in schools.

This study has been approved by the Curtin University Human Ethics Committee. If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth 6845 or by telephoning (08) 9266 2784.

L.3 Teacher consent form

Please complete the following consent form and return it in the reply paid envelope if you agree to participate in this study.

This form is available in alternative to print formats if required.

See also information sheet attached

1. ____

The undersigned PLEASE PRINT

Agree to take part in the research project entitled: Predictors of successful inclusion for children with vision impairment in early education.

2. I acknowledge that I have read / been read the information sheet. I have had the project, so far as it affects me, fully explained to my satisfaction by the researcher, and my consent is freely given.

3. I have been informed that while information gained during the study may be published, I will not be identified in these publications and my personal results will not be divulged. Likewise, the name and identifying details of the School will not be disclosed.

4. I understand that I am free to withdraw from the project at any time.

Signature of Teacher: ______________________ Date:____________

School Name:____

School Address:____

Name of Student with Vision Impairment: _____________________

Teacher Name:____

Teacher Contact Phone Number:______________________________

Fax Number:____

Teacher Email Address:_____________________________________

Number of parent invitations you require for typically performing classmates____

Thank you for your cooperation

This study has been approved by the Curtin University Human Ethics Committee. If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth 6845 or by telephoning (08) 9266 2784.

APPENDIX M. LETTER TO TEACHERS TO RECRUIT CLASSMATES

Dear [Teacher]

Thankyou for agreeing to participate in the Curtin University study being conducted by [researcher name], entitled *Predictors of successful inclusion for children with vision impairment in early education.* I greatly appreciate your assistance.

As I mentioned in my last letter this study requires information to be collected about children with vision impairment and group of typically performing classmates to be used as a comparison group. This information will allow comparison of the social and academic performance of students with and without vision impairment within the same classroom environment.

In this next stage, I request your help to identify then distribute invitations to parents of these typically performing families. Please identify all of the classmates who potentially fit the following description:

1. The same gender as the child with vision impairment;
2. A similar age (up to either 6 months older or younger) as the child with vision impairment;
3. Unrelated to the child with vision impairment in the study;
4. 'Typically' performing;
5. Without significant physical, intellectual, psychological or behavioural disabilities;
6. Not attending a specialised unit in a mainstream school; and
7. Not previously retained in a school grade.

I am seeking to recruit at least two of [Child's name] classmates for this study. I have attached [number] copies of the Classmate Parent Invitation Letters, Parent Information and Parent Consent Forms which I request that you send to any potential families. They will then reply to me if they are interested in participation.

To this package of forms, I ask that you add a cover letter (either from yourself or the school principal) verifying your participation in the study and the confidentiality of the family's details. I have attached a pro-forma.

I would greatly appreciate if you could then forward the letters to the relevant families. The parent/guardian will then contact the researcher directly to volunteer participation using the envelopes provided.

If you have any queries, please contact me on [number] or [email address]. I will contact you in the near future to send you the relevant questionnaires arrange suitable times to observe [Child's name] in your classroom.

Thankyou again for your time invested in this project.

[Researcher Name]

APPENDIX N. PARENT OF CLASSMATE RECRUITMENT FORMS

N.1 Parent of Classmate Invitation Letter

Dear Parent,

AN OPPORTUNITY TO PARTICIPATE IN A NATIONAL STUDY FOR YOUNG CHILDREN WITH AND WITHOUT VISION IMPAIRMENT

Yours and other Australian families whose child has a classmate with vision impairment or blindness have been contacted to participate in a Curtin University study. Your [School name] is assisting with this research which investigates predictors of successful inclusion for children with vision impairment in early education.

To ensure the information that we collect on children with vision impairment is meaningful, we need to compare it to a group of typically performing children. Your child's principal and teacher have given permission for this project to be conducted in your child's classroom.

Your child's teacher, [Teacher's name] has forwarded this letter to you because your child is eligible to participate as part of the comparison group – that is, your child is a similar age, same gender and in the same classroom as the student with vision impairment. We request your help and encourage you to participate in the study.

This research is important since it will influence the early intervention programs preparing these children for school and the provision of early schooling for children with and without vision impairment. It will help children overcome barriers they may face to successful school experiences.

As a parent, you have valuable knowledge of your child's abilities. This project is designed to involve you in completing questionnaires about your child and your family. To add to this information we would like to approach your child's principal and teacher with an interview and questionnaire. We are also requesting your permission for the researcher to observe your child in his or her classroom, participating in academic and social classroom activities (refer to info. letter).

The results from the interviews, observations and questionnaires will be used to produce information to help with early intervention and school programs.

If you would like your family and your child to be involved please return the attached consent form to Curtin University of Technology in the reply paid envelope by [date]. If you have any questions please telephone me on [number], e-mail [address], or call my supervisor [name] on [number].

Thank you for your time and assistance.
Yours sincerely,

[Researcher Name]

N.2 Parent of Classmate Information Sheet

TITLE: Predictors of successful inclusion for children with vision impairment in early education.

We are currently conducting a research project to identify factors influencing the social and academic success of children with vision impairment and blindness in regular schools. Cherylee Lane will undertake this research as part of the requirements of her PhD program in the School of Occupational Therapy at Curtin University, WA. The research is supervised by Professor Tanya Packer.

As part of this research we are collecting information from three different groups: (1) parents of children with and without vision impairment, (2) teachers of children with vision impairment and (3) children with and without vision impairment themselves.

Participating in this study involves four things from you. These are:

1. Completing a questionnaire
These will provide valuable data on:

- General family and child demographic information.
- Parent ratings on children's skills

2. Completing follow-up questionnaires in Term 4 2005 [&/or] 2006
This will demonstrate the changes your child has made over the year.

3. Providing consent for me to contact your child's school and teacher
Questionnaires and interviews will be conducted with your child's teacher to provide information on:

- The school attitudes and ability to include a child with vision impairment.
- Classroom, social and academic skills of children with vision impairment.
- General demographic information.

4. Providing consent to participate and for your child to be observed in his or her school
Observing your child interacting in the classroom will demonstrate:

- Participation in academic and social classroom activities. Observations will be over one day in your child's classroom in Term 1 and 4, [2005 or 2006] [and Term 4, 2006]. I will conduct the observations personally (with an assistant) and will not interrupt the usual classroom schedule.

All information obtained as part of these questionnaires and observations will be treated as confidential, securely stored and you will not be identified in any reports. No vision or education agency will be able to access your individual comments during the study. All results will be described only in terms of groups, and you and your child's anonymity will be maintained throughout the study.

You are not obliged to participate in this study. You are able to withdraw from the study at any time without penalty. Either withdrawing from the study or declining to participate will in no way affect your relationship with any vision or education agency you are involved with.

Information from this research will be presented in the form of a thesis and may be published in a scholarly journal or report to service providers and consumers. It is anticipated that the findings of this study will result in the improvement in quality of social and academic outcomes for children with vision impairment.

The finding of this study will help to improve the preparation and early education services provided to children with vision impairment and provide professionals with essential information to ensure this. If you are willing to assist would you please contact me as soon as possible on [number] or email: [address] before [date]. Please send completed forms in envelopes provided.

Yours sincerely,

[Researcher Name]

Thankyou for your valued time and assistance!

This study has been approved by the Curtin University Human Ethics Committee. If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth 6845 or by telephoning (08) 9266 2784.

N.3 Parent of Classmate Consent Form

Please complete the following consent form if you agree to participate in this study. This form is available in large print, Braille and audio formats. If you do not feel comfortable signing this form we can arrange to audio tape your consent.

Parent/guardian consent is required for children under 18 years.

See also information sheet attached

1. ____

The undersigned PLEASE PRINT

Agree to take part in the research project entitled: Predictors of successful inclusion for children with vision impairment in early education.

2. I acknowledge that I have read / been read the information sheet. I have had the project, so far as it affects me, fully explained to my satisfaction by the researcher, and my consent is freely given.

3. I have been informed that while information gained during the study may be published, I will not be identified in these publications and my personal results will not be divulged.

4. I understand that I am free to withdraw from the project at any time.

Parent/ guardian signature:__________________________ Date:______________

Parent/guardian name:____

Child's name: ____

Home address:____

Your contact phone number: _____________ Child's date of birth: ____________

Child's gender:____________Child's school level in [2005 or 2006]:___________

Child's school name: ____

Child's school address:____

Child's teacher:____

Thank you for your cooperation.

This study has been approved by the Curtin University Human Ethics Committee. If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth 6845 or by telephoning (08) 9266 2784.

APPENDIX O. CURTIN UNIVERSITY PHASE 2 ETHICS CLEARANCE

memorandum

Curtin University of Technology

Office of Research and Development

Human Research Ethics Committee

TELEPHONE 9266 2784
FACSIMILE 9266 3793
EMAIL s.darley@curtin.edu.au

To	Cherylee Lane Centre for Research into Disability and Society, School of Occupational Therapy
From	Max Page, Executive Officer, Human Research Ethics Committee
Subject	Protocol Approval **HR 177/2004**
Date	5 November 2004
Copy	Professor Tanya Packer and Doctor Anne Passmore, School of Occupational Therapy

Thank you for your application submitted to the Human Research Ethics Committee (HREC) for the project titled *"Factors influencing the social, participatory and academic success of young children with vision impairment in mainstream education in Australia: phase 2- longitudinal analysis of student outcomes".*

Your application has been reviewed by members of the HREC reviewing panel who have recommended that your application be approved, hence you are authorised to commence your research as stated in your proposal. However please note that all recommendations for approval are referred to the next meeting of the HREC for ratification. In the event the Committee does not ratify the recommendation, or would like further information, you will be notified. The next meeting of the HREC is on 14/12/2004.

Approval of this project is for a period of twelve months **5/11/2004** to **4/11/2005**.

If you are a Higher Degree by Research student data collection must not begin prior to receiving approval for your Application for Candidacy from your Divisional Graduate Studies Committee.

Applicants should note that it is the policy of the HREC to conduct random audits on a certain percentage of projects that have been approved. These audits may be conducted at any time following the commencement of the project. In cases where the HREC considers that there may be a risk of adverse events, or where participants may be especially vulnerable, the HREC may request the chief investigator to provide an outcomes report including information on follow up of participants.

When the project has finished or if at any time during the twelve months changes/amendments occur, or if a serious or unexpected adverse event occurs, the attached FORM B is to be completed and returned to Mrs Sinéad Darley, (Secretary, HREC) C/- Office of Research & Development as soon as possible. The approval number for your project is **HR 177/2004**. *Please quote this number in any future correspondence.*

Please find attached your protocol details together with the application form/cover sheet.

SDarley.

pp Maxwell Page
Executive Officer
Human Research Ethics Committee

Please Note: The following standard statement must be included in the information sheet to participants:
This study has been approved by the Curtin University Human Research Ethics Committee. If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth, 6845 or by telephoning 9266 2784.

APPENDIX P. EDUCATION BODY ETHICS CLEARANCE

P.1. Department of Education and Training Victoria Ethics Clearance

Department of Education & Training

Office of Learning and Teaching

SOS002803

Ms Cherylee Lane
17 Braydon Road
ATTADALE WA 6156

Dear Ms Lane

Thank you for your application of 11 October 2004 in which you request permission to conduct a research study in government schools titled: *Factors influencing the social, participatory and academic success of children with vision impairment in early mainstream education in Australia.*

I am pleased to advise that on the basis of the information you have provided your research proposal is approved in principle subject to the conditions detailed below.

1. Should your institution's ethics committee require changes or you decide to make changes, these changes must be submitted to the Department of Education and Training for its consideration before you proceed.

2. You obtain approval for the research to be conducted in each school directly from the principal. Details of your research, copies of this letter of approval and the letter of approval from the relevant ethics committee are to be provided to the principal. The final decision as to whether or not your research can proceed in a school rests with the principal.

3. No student is to participate in this research study unless they are willing to do so and parental permission is received. Sufficient information must be provided to enable parents to make an informed decision and their consent must be obtained in writing.

4. As a matter of courtesy, you should advise the relevant Regional Director of the schools you intend to approach. An outline of your research and a copy of this letter should be provided to the Regional Director.

5. Any extensions or variations to the research proposal, additional research involving use of the data collected, or publication of the data beyond that

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East Melbourne, Victoria 3002
Telephone: +61 3 9637 2000
DX 210083

GPO Box 4367
Melbourne, Victoria 3001

Victoria
The Place To Be

normally associated with academic studies will require a further research approval submission.

6. At the conclusion of your study, a copy or summary of the research findings should be forwarded to the Research and Development Branch, Department of Education and Training, Level 2, 33 St Andrews Place GPO Box 4367 Melbourne 3001.

I wish you well with your research study. Should you have further enquiries on this matter, please contact Louise Dressing, Senior Policy Officer, Research on 9637 2349.

Yours sincerely

M. G. Hayford

John McCarthy
Assistant General Manager
Research and Innovation Division

23 / 12 / 2004

enc

P.2. New South Wales Department of Education and Training Ethics Clearance

PLANNING AND INNOVATION

NEW SOUTH WALES
DEPARTMENT
OF EDUCATION
AND TRAINING

Early Childhood and Primary Education
Secondary Education
Technical and Further Education
Vocational Education and Training
Higher Education
Adult and Community Education

Cherylee Lane
17 Braydon Road
Attadale WA 6156

Dear Miss Lane SERAP Number: 04.207

I refer to your application to conduct a research project in NSW government schools entitled *Factors influencing the social, participatory and academic success of children with vision impairment in early mainstream education in Australia.* I am pleased to inform you that your application has been approved. You may now contact the Principals of the nominated schools to seek their participation. Please inform us of the final list of schools you will use once these schools are known.

This approval will remain valid until 11/10/05.

This approval covers the following researchers and research assistants to enter schools for the purposes of this research: Cherrylee Mary Lane only.

You should include a copy of this letter with the documents you send to schools.
I draw your attention to the following requirements for all researchers in NSW government schools:

- School Principals have the right to withdraw the school from the study at any time. The approval of the Principal for the specific method of gathering information for the school must also be sought.
- The privacy of the school and the students is to be protected.
- The participation of teachers and students must be voluntary and must be at the school's convenience.
- Any proposal to publish the outcomes of the study should be discussed with the Research Approvals Officer before publication proceeds.

When your study is completed please forward your report marked to General Manager, Planning and Innovation, Department of Education and Training, GPO Box 33, Sydney, NSW 2001.

Yours sincerely

Gill Yates

Gill Yates
A/General Manager, Planning and Innovation
24 February 05

• Level 6, 35 Bridge Street • Sydney NSW 2000 • GPO Box 33 • Sydney NSW 2001 •
• *telephone* 02 9561 8744 • *facsimile* 02 9561 8941 • www.det.nsw.edu.au •

P.3. Queensland Department of Education and the Arts Ethics Clearance

Queensland Government

Department of
Education and the Arts

18 March 2005

Miss Cherylee Lane
Curtin University of Technology
School of Occupational Therapy
GPO Box U1987
PERTH WA 6845

Dear Miss Lane,

Thank you for your application seeking approval to conduct research titled *"Factors influencing the social, participatory and academic success of children with vision impairment in early mainstream education in Australia"* in Queensland State Schools. I wish to advise that your application has been approved subject to your confirmation of participating schools.

This means that you can approach principals of the schools and invite them to support your research project. As detailed in the research guidelines:

- You need to obtain approval from the relevant principals before your research project can commence.
- Principals have the right to decline participation if they consider that the research will cause undue disruption to educational programs in their schools.
- Principals have the right to monitor any research activities conducted in their facilities and can withdraw their support at any time.

At the conclusion of your study, you are required to provide the Department of Education and the Arts with a summary of your research results and any published paper resulting from this study. A summary of your research findings should also be forwarded to participating principals.

Should you require further information on the approval process please do not hesitate to contact Dr Roland Simons, Senior Research Officer, Strategic Policy and Education Futures Division on (07) 3237 0417. Please quote the file number 550/27/302 in future correspondence.

Please note that I have attached some comments from our Disability Services Support Unit (DSSU). The last point is a question that we would appreciate some clarification on. Please note that your research application approval will not be affected by your response to this question.

Yours sincerely

C Markie-Dadds

Carol Markie-Dadds
A/Assistant Director
Education Futures
Strategic Policy and Education Futures Division
Trim ref: 05/20016

Encl.

Strategic Policy and Education Futures
Level 21 Education House
30 Mary Street Brisbane 4000
PO Box 15033 City East
Queensland 4002 Australia
Telephone +61 7 3405 5738
Facsimile +61 7 3237 1175
Website www.education.qld.gov.au
ABN 76 337 613 647

P.4. Catholic Education Commission of Victoria Ethics Clearance

CATHOLIC EDUCATION COMMISSION OF VICTORIA

CATHOLIC EDUCATION COMMISSION OF VICTORIA

JAMES GOOLD HOUSE
228 VICTORIA PARADE
EAST MELBOURNE VIC 3002

Telephone: (03) 9267 0228
Facsimile: (03) 9415 9325

Correspondence: PO Box 3, East Melbourne Vic 3002
Email: director@ceo.melb.catholic.edu.au
ABN 85 176 448 204

In Reply Please Quote:

GE05/0009
1062

10 February 2005

Ms C Lane
School of Occupational Therapy
Curtin University of Technology
GPO Box U1987
PERTH WA 6845

Dear Ms Lane

I am writing with regard to your letter of 15 December 2004 in which you referred to your forthcoming research project titled *Factors Influencing the Social, Participatory and Academic Success of Children with Vision Impairment in Early Mainstream Education in Australia.* I understand that this research is part of your doctoral studies at Curtin University of Technology. You have asked approval to approach Catholic schools in Victoria as you wish to involve students aged 3 to 6 years.

I am pleased to advise that your research proposal is approved in principle subject to the following standard conditions.

1. The decision as to whether or not research can proceed in a school rests with the School Principal. So you will need to obtain approval directly from the Principal of each school that you wish to involve.

2. You should provide each Principal with an outline of your research proposal and indicate what will be asked of the school. A copy of this letter of approval, and a copy of notification of approval from the University's Ethics Committee, should also be included.

3. A Criminal Record check is necessary for all researchers visiting schools. A certificate may be obtained on application to the Victoria Police and this must be shown to the Principal before starting the research in each school.

4. No student is to participate in the research study unless s/he is willing to do so and informed consent is given in writing by a parent/guardian.

...2

5. You should provide the names of schools which agree to participate in the research project to the Knowledge Management Unit of this Office.

6. Any substantial modifications to the research proposal, or additional research involving use of the data collected, will require a further research approval submission to this Office.

7. Data relating to individuals or schools are to remain confidential.

8. Since participating schools have an interest in research findings, you should discuss with each Principal ways in which the results of the study could be made available for the benefit of the school community.

9. At the conclusion of the study, a copy or summary of the research findings should be forwarded to this Office.

I wish you well with your research study. If you have any queries concerning this matter, please contact Mr Mark McCarthy of this Office.
The email address is mmccarthy@ceo.melb.catholic.edu.au.

Good wishes

Yours sincerely

Teresa Angelico

Susan Pascoe
EXECUTIVE DIRECTOR

P.5. Diocese of Toowoomba Catholic Education Office Ethics Clearance

DIOCESE OF TOOWOOMBA
CATHOLIC EDUCATION OFFICE

Telephone: (07) 4637 1400
Fax: (07) 4637 1499
ABN: 88 934 244 646

PO Box 756
73 Margaret Street
Toowoomba Q 4350

...... act justly; love tenderly; walk humbly with your God.
Micah 6:8

095
JAB/ao'r
December 02, 2004

Ms Cherylee Lane
PhD Candidate
Curtin University of Technology
GPO Box U1987
PERTH WA 6845

Dear Cherylee

Re: Permission to Conduct Research in Toowoomba Catholic Schools

Thank you for the invitation to be involved in research relating to factors influencing the school success of children with vision impairment in early mainstream education in Australia.

I give my permission for you to approach school Principals in the Diocese of Toowoomba to take part in this research, if required.

I note also that approval has been granted by the Human Research Ethics Committee for research project HR 169/2004 to take place and that the approval period will conclude on 11/10/2005, not 2004 as indicated.

Best wishes for a successful research project. I look forward to receiving a copy of your findings.

Yours sincerely

John Borserio

JOHN BORSERIO
Director

cc: Margaret Hendriks

P:\Director\Restricted\General Documents\2004\Curtin-Research-December02-04.doc

P.6. Catholic Education Diocese of Rockhampton Ethics Clearance

www.rok.catholic.edu.au

Catholic Education
Diocese of Rockhampton
Meaning for Life

2 December 2004

Ms Cherylee Lane
PhD Candidate
Curtin University of Technology
GPO Box U1987
PERTH WA 6845

Dear Cherylee

Thank you for your recent letter requesting permission to conduct research with the Diocese of Rockhampton Catholic pre-primary and primary schools.

Cherylee. I am happy to grant permission for you to contact Principals to seek their permission to approach the staff and parents to be involved in collecting your data.

I hope the research goes well and I look forward to receiving some feedback in due course.

Kind regards

Miss Leesa M Jeffcoat
(M.Ed.Admin., B.Ed., B.A., Dip.Teach., A.S.D.A., A.Mus.A., M.A.C.E.)
DIOCESAN DIRECTOR CATHOLIC EDUCATION

The Director
143 West St, Rockhampton Q 4700
PO Box 524, Rockhampton Q 4700
07 4931 3652
07 4931 3701
director@rok.catholic.edu.au
ABN: 21 528 592 597

P.7. Catholic Education Archdiocese of Brisbane Ethics Clearance

Catholic Education
Archdiocese of Brisbane

243 Gladstone Road, Dutton Park.
GPO Box 1201 Brisbane 4001 Australia
Phone: (07) 3840 0400 - Fax: (07) 3844 5101
http://www.bne.catholic.edu.au

A11.071 L.E.
21 January 2005

Ms Cherylee Lane
PhD Candidate
School of Occupational Therapy
Curtin University of Technology
GPO Box U1987
Perth WA 6845

Dear Ms Lane

Thank you for your letter regarding permission to approach Brisbane Catholic Education schools for your research on *'Factors influencing the social, participatory and academic success of children with vision impairment in early mainstream education in Australia'.* Permission is granted to approach the following schools and principals within the Archdiocese of Brisbane:

[redacted]

I would ask you to contact the principals of the respective schools seeking their involvement in the project.

Please note that participation in your study is at the discretion of each of the principals.

If you have any further queries, please contact me on (07) 3840 0427.

Yours sincerely

Lisa Eastment
Research Coordinator
Catholic Education
Archdiocese of Brisbane

APPENDIX Q. TEACHER DEMOGRAPHIC QUESTIONNAIRE

Please answer the following questions about yourself and your class

1. Your age: __________years
2. Your gender:_______
3. Number of students in your present class:_________
4. What year levels do you teach in your present class?____________
5. Number of years teaching experience: _______________________

Teacher Training and Experience

6. Please indicate the training you have received regarding inclusive education (tick one box per item):

   A. Number of Bachelor Degree units (of one semester duration) completed regarding inclusive education, inclusive teaching practices or vision impairment:

   □1 0
   □2 1 - 2
   □3 3 – 4
   □4 > 4

   B. Number of Postgraduate Degree units (of one semester duration) completed regarding inclusive education, inclusive teaching practices or vision impairment:

   □1 0
   □2 1 - 2
   □3 3 – 4
   □4 > 4

   C. Average number of hours per year spent attending professional development sessions (in-house, conference etc.) regarding inclusive education, inclusive teaching practices or vision impairment in a typical working year:

   □1 0
   □2 1 – 4hrs/yr
   □3 >4 – 8hrs/yr
   □4 > 8hrs/yr

D. Number of years previous experience teaching a child or children with vision impairment:

- □1 0
- □2 1 - 2 yrs
- □3 >2 - 4 yrs
- □4 > 4 yrs

E. Number of years previous experience teaching a child or children with another disability (other than vision impairment):

- □1 0
- □2 1 - 2 yrs
- □3 >2 - 4 yrs
- □4 > 4 yrs

7. Your schools' postcode: □□□□

Scoring scale for Item 6: Teacher Training and Experience (not included on teacher questionnaire)

Office use only					
A 1 2 3 4 0 1 2 3	B 1 2 3 4 0 2 3 4	C 1 2 3 4 0 1 2 3	D 1 2 3 4 0 4 812	E 1 2 3 4 0 3 6 8	Total Sum

Vision Aides and Resources
In the following questions "vision specific resources" refers to: vision aides (magnifier, monocular, CCTV, enlarged screen); computer software and voice output; enlarged print books or worksheets; Braille books, worksheets, labels; tactile or audio books, worksheets, labels; tilt boards.

8. Rate the presence of vision specific resources in the classroom for the child with vision impairment:

   a. None of the vision specific resources that have been recommended by a special educator, visiting teacher, therapist or orthoptist are available in the classroom.
   b. Few of the vision specific resources that have been recommended by a special educator, visiting teacher, therapist or orthoptist are available in the classroom.
   c. Most of the vision specific resources that have been recommended by a special educator, visiting teacher, therapist or orthoptist are available in the classroom.
   d. All of the vision specific resources that have been recommended by a special educator, visiting teacher, therapist or orthoptist are available in the classroom.
   e. No vision specific resources have been recommended by a special educator, visiting teacher, therapist or orthoptist for use in the classroom.

9. Rate the timeliness regarding access to vision specific resources in the classroom for this child with vision impairment:
    a. The vision specific resources that have been recommended by a special educator, visiting teacher, therapist or orthoptist are <u>never available</u> for use in the classroom at the time required to participate in class activities.
    b. The vision specific resources that have been recommended by a special educator, visiting teacher, therapist or orthoptist are <u>seldom available</u> for use in the classroom at the time required to participate in class activities.
    c. The vision specific resources that have been recommended by a special educator, visiting teacher, therapist or orthoptist are <u>often available</u> for use in the classroom at the time required to participate in class activities.
    d. The vision specific resources that have been recommended by a special educator, visiting teacher, therapist or orthoptist are <u>always available</u> for use in the classroom at the time required to participate in class activities.
    e. <u>No</u> vision specific resources have been recommended by a special educator, visiting teacher, therapist or orthoptist for classroom use.

10. Rate the training that classroom staff have received regarding the use of vision specific resources available in the classroom for the child with vision impairment.
    a. Classroom staff have <u>not received any training</u> regarding use of vision specific resources that are available in the class.
    b. Classroom staff have <u>received some training</u> regarding use of vision specific resources that are available in the class, however <u>much more is needed</u>.
    c. Classroom staff have <u>received training</u> regarding use of vision specific resources that are available in the class, however some <u>more is needed.</u>
    d. Classroom staff have <u>received training</u> regarding use of vision specific resources that are available in the class, and this was <u>enough.</u>
    e. No vision specific resources are available in the classroom.

11. Rate the training that the child with vision impairment received regarding the use of vision specific resources in the classroom.
    a. The child has <u>not received any training</u> regarding use of vision specific resources that are available in the class.
    b. The child has received <u>some training</u> regarding use of vision specific resources that are available in the class, however <u>much more is needed</u>.
    c. The child has received <u>training</u> regarding use of vision specific resources that are available in the class, however <u>some more is needed</u>.
    d. The child has received training regarding use of vision specific resources that are available in the class, and this was <u>enough</u>.
    e. No vision specific resources are available in the classroom.

Vision aides and equipment scoring scale (not included on Teacher Questionnaire)

1	a 1	b 2	c 3	d 4	e N/A
2	a 1	b 2	c 3	d 4	e N/A
3	a 1	b 2	c 3	d 4	e N/A
4	a 1	b 2	c 3	d 4	e N/A
Total sum = Do not score any items of questionnaires that have N/A					

APPENDIX R. ADMINISTRATOR DEMOGRAPHIC QUESTIONNAIRE

Your age: ______________

Your gender: ___________

Your school postcode: ☐☐☐☐

Date questionnaire completed: _______________________

APPENDIX S. FAMILY DEMOGRAPHIC QUESTIONNAIRE

We would like to know something about you and your child.
Please fill out the following to the best of your ability.

1. Your present age: ________ in years

2. Your current postcode? □□□□

3. How many children do you have?________

4. What is the date of birth, age (in years) and gender of each child?

	Date of birth	Age (yrs)	Gender	Does this child have vision impairment?	Is this child involved in the study?
1st born child				□ Yes □ No	□ Yes □ No
2nd born child				□ Yes □ No	□ Yes □ No
3rd born child				□ Yes □ No	□ Yes □ No
4th born child				□ Yes □ No	□ Yes □ No
5th born child				□ Yes □ No	□ Yes □ No

The following questions related to the child who is involved in this study

5. What is your relationship to the child who is involved in this study?

   □1 Mother (biological or adoptive) □4 Father (biological or adoptive)
   □2 Foster mother □5 Foster father
   □3 Step-mother □6 Step-father
   □7 Other (please specify)___________________________________

6. Child's current school level:
   □1 Kindergarten WA & QLD or Preschool VIC)
   □2 Pre-primary WA / Preschool QLD/ Kindergarten/ Prep Vic
   □3 Year 1

7. Number of terms your child *previously* spent attending the present school or program:______ terms

8. How often does your child attend the program? _____Hrs/day____ Days/Wk
   Is this considered full time for that program? □1 Yes
   □2 No

9. Please indicate the type, frequency and number of months your child spent (if any) regularly attending or receiving formal early intervention between birth to 3yrs of age.

□1 Early intervention therapy _________days / month ________ no. months
□2 Early education service (excluding child care)_____days /mth______ no. mth
□3 Other (please specify) ________days / month ________ no. months

---

10. Does your child have vision impairment?
□1 **Yes, go to question 11**
□2 **No, go to question 16**

---

11. Do you know what your child's level of vision acuity is?

Left eye:
□1 Better than 6/18
□2 Between less than 6/18 – 6/60
□3 Between less than 6/60 – 3/60
□4 Less than 3/60
□5 Other (please specify) ____________

Right eye:
□1 Better than 6/18
□2 Between 6/18 – 6/60
□3 Between less than 6/60 – 3/60
□4 Between less than 3/60
□5 Other (please specify) _____

---

12. Do you know what your child's level of visual field is?

□1 No field restrictions
□2 0-10 degree restriction
□3 >10-20 degree restriction
□4 > 20 degree restriction
□5 Other (please specify) ______________________

13. What is your child's vision condition?______________________________

14. What age was your child diagnosed with vision impairment?_____ months

15. At what age did you first realise that your child had a problem with their vision?______ months

16. Does your child have any additional disabilities?
□1 Yes, please specify ____
□2 No

17. If Yes, how would you describe your child's disability:

- □1 Barely noticeable
- □2 Only noticeable after spending a long time with him/her
- □3 Only noticeable after spending a short time with him/her
- □4 Can be noticed by most people

The remaining questions relate to you and/or your partner

18. What language is primarily spoken in your family home?

- □1 English
- □2 Language other than English, please specify ________________

19. What is your present marital status? (check one box only)

□1 Married	□3 Divorced/separated/widowed
□2 Never married	□4 Other (please specify)__________

20. What is the highest level of education that you have completed? (check one box only)

- □1 Primary School
- □2 Year 10 High School
- □3 Year 12 High School
- □4 TAFE or other diploma (beyond Year 12)
- □5 University degree
- □6 Other (please specify)________________________

21. In which of these groups is your family's income before tax

- □1 Less than $154 per week ($8000 per year)
- □2 $155-$385 per week ($8,001-$20,000 per year)
- □3 $386-$577 per week ($20,001-$30,000 per year)
- □4 $578-$769 per week ($30,001-$40,000 per year)
- □5 $770-$961 per week ($40,001-$50,000 per year)
- □6 $962-$1154 per week ($50,001-$60,000 per year)
- □7 $1155-$1346 per week ($60,001-$70,000 per year)
- □8 More than $1347 per week (>$70000 per year)

Appendix T. OPERATIONALISED QUALITY OF INCLUSIVE EXPERIENCES MEASURE INFORMATION

Table T1. Adult-Child Contacts and Interactions data recording sheet

2 - min interval	**Item 1.** **Degree of adult involvement** of any adult that interacts with child Tally				
	Uninvolved	**Minimal involvement**	**Appropriate involvement**	**Over involvement**	**Excessive involvement**
1					
2					
3					
4					
5					
…					
20					
TOTAL %					

Adult Involvement Key:
Uninvolved = adult spends no time, though child doesn't participate or behaves very inappropriate
Minimal involvement= spends insufficient time (some)/ insufficient assistance for child to active participate and/or behave appropriately
Appropriate= allows child to be actively involved, behave appropriately & allow independence – may or may not need time
Over involvement = spends too much time with child & impedes on ability to independently participate
Excessive involvement = spends all time with them & acts as barrier for child to directly or independently participate

Table T2. Actual Individualisation: High-priority objectives data recording sheet

Question	Objective 1:	Objective 2:	Objective 3:	Objective 4:
8 **What** are you doing differently for this child from other children to promote learning of each objective? e.g. strategies, procedures, special schedule, activities, routines, space, materials, peers or staff practices.				
9. **Who** teaches the objective /provides experiences to meet the objective?				
10. **Generalise -** what (if anything) is being done to get the child to generalise or transfer the skill to new or different situations? e.g. strategies, procedures, special schedule, activities, routines, materials, peers or staff practices				
11. Is the child's learning of the objective being measured at least weekly?	YES NO	YES NO	YES NO	YES NO
12. **Who** is collecting this information? *(Do not answer if 11 is "No")* What is their level of involvement	1. Not very 2. Somewhat 3. Very 4. Extremely	1. Not very 2. Somewhat 3. Very 4. Extremely	1. Not very 2. Somewhat 3. Very 4. Extremely	1. Not very 2. Somewhat 3. Very 4. Extremely
13. Are the strategies, procedures or special arrangements changed or altered because of the data collected If so, how often? *(Do not answer if 11 is "No" or if teacher is not involved in collection)*	YES NO 1. Never 2. Rarely 3. Sometimes 4. Frequently 5. Very Frequently	YES NO 1. Never 2. Rarely 3. Sometimes 4. Frequently 5. Very Frequently	YES NO 1. Never 2. Rarely 3. Sometimes 4. Frequently 5. Very Frequently	YES NO 1. Never 2. Rarely 3. Sometimes 4. Frequently 5. Very Frequently

Generalisation = transfer or apply the skill that is learnt in one setting (such as the classroom) to a different setting (such as the playground or library).
Activities = the tasks that the child is undertaking.
Routines = things that are undertaken regularly, such as fruit time, toilet-time reminders, preparation for class in the mornings.
Transitions = moving from one activity to another, such as packing up one's desk, lining up for class, preparing for a different activity.
Procedures = methods and strategies to specifically target the child's needs.

Table T3. Accessibility and Adequacy of the Physical Environment data recording sheet

Item 1. Adequacy of the classroom equipment and environment (e.g.: black/white board, desks, computer, mat, lighting)								
	Child Desk • Height • Placement	**Black/white board** • Clean • Contrast • Position • Glare	**Mat** • Contrast • Position • Safety • Access	**Lighting** • Glare • Lux	**Computer** • Height • Position • Access	**Teacher desk** • Position • Access	**Other**	**% of areas with over 50% appropriate equipment**
No. appropriate & facilitates use								
No. inappropriate or impedes use								
Percentage of appropriate								

Note. When answering the following questions, consider the following features of the physical environment:

- Brightness, colour contrasting or contrast marking; Tactile features: tactile marking, Braille, textures; Simplified visual arrangement: reduced visual clutter;
- Physical access: clearly defined accessible pathways; Height: access to eye height; Sound, audio or echo features;
- Magnified or enlarged features; Lighting: brightness and glare; as appropriate to vision condition outlined in 'education implications of vision impairment matrix'(Mason, 1999).

(table continues)

Table T3. ***(continued)***

	Classroom centre / areas (as relevant to classroom)										
	Bag store	Eating, food area	Reading, book area	Activity /messy area	Construct, block area	Dress-up, kitchen area	Tech. area	Desk area	Other	Other	Total %
Item 2. Adequacy of the materials in classroom centres/areas (e.g.: books, posters in reading area, toys and games in explorative play area, computer software in technology area)											
% Appropriate materials in area child can use without help as age appropriate (once in the area, can have help getting there)											
Item 3. Child with disabilities' participation in classroom centres/areas Credit if: assisted into area, No credit: doesn't participate when in area / precluded because of the disability or staff decision / staff don't allow in area,											
Child participates in area? (Reported or observed) Credit if: assisted into area, No credit: doesn't participate when in area; precluded because of the disability or staff decision, staff don't allow in area	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	

Note. When answering the following questions, consider the following features of the physical environment*:* *(table continues)*

- Brightness, colour contrasting or contrast marking; Tactile features: tactile marking, Braille, textures; Simplified visual arrangement: reduced visual clutter;
- Physical access: clearly defined accessible pathways; Height: access to eye height; Sound, audio or echo features;
- Magnified or enlarged features; Lighting: brightness and glare; as appropriate to vision condition outlined in 'education implications of vision impairment matrix'(Mason, 1999).

Table T3. ***(continued)***

Item 5. Adequacy of the playground and outside play (e.g.: access, tactile outdoor floor surfaces, rails, contrast or tactile marking on equipment and outdoor area)								
Rating items	**Playground equipment and areas (as relevant to school)**							
	Access from class to play	Climbing/ playground	Bikes	Sandpit	Other toys	Other toys	Other toys	Total %
Approp/ Usable? (tick)	Contrast/tactile Can find it Can get on it Safe for use	Contrast/tactile Can find it Can get on it Safe for use	Contrast/tactile Can find it Can get on it Safe for use	Contrast/tactile Can find it Can get on it Safe for use	Contrast/tactile Can find it Can get on it Safe for use	Contrast/tactile Can find it Can get on it Safe for use	Contrast/tactile Can find it Can get on it Safe for use	
Child needs assistance	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	
If yes: do staff provide assistance? **If no: do staff encourage play?**	never occasionally regularly consistently did not use	never occasionally regularly consistent did not use	never occasionally regularly consistent did not use	never occasionally regularly consistently did not use	never occasionally regularly consistently did not use	never occasionally regularly consistently did not use	never occasionally regularly consistent did not use	

Note. When answering the following questions, consider the following features of the physical environment:

- Brightness, colour contrasting or contrast marking; Tactile features: tactile marking, Braille, textures; Simplified visual arrangement: reduced visual clutter;
- Physical access: clearly defined accessible pathways; Height: access to eye height; Sound, audio or echo features;
- Magnified or enlarged features; Lighting: brightness and glare; as appropriate to vision condition outlined in ‘education implications of vision impairment matrix’.

Table T4. Child-Child Contacts and Interactions data recording sheet

2 min interval	**1. Nature of interaction** Can rate if just an initiation or just a response.			**2. Is it appropriate to interact?**		**2. Interaction with any child?** Initiation and response		**3. Initiator**		**4. Did observed child respond to other children's initiations?**		**5. Did other children respond to observed child initiations?**	
	Negative	Neutral	Positive	Yes	No	Yes	No	Observed Child	Any other child	Yes	No	Yes	No
1													
2													
3													
4													
5													
….													
20													
Total Tally													
% Total				**% of total appropriate interactions**									

Nature of interaction key:
Positive = display of positive affect from both children (laugh/smile)
Neutral = do not meet positive or negative
Negative = display of negative affect by one or both (verbally /non verbally protests, aggresses, cries)

Definition of interaction:
Interaction= INITIATION and RESPONSE. child has with another child. May involve verbal or non- verbal behaviour (e.g. child gives toy & another takes it).

Table T5. Quality of Inclusive Experiences Measure original and operationalised scoring

Item	Original scoring	Operationalised scoring
	Accessibility and Adequacy of the Physical Environment	
Item 1 Adequacy of furniture	Not adapted	0% of furniture and layout is adequate
	Chairs and tables adapted	>0-33% of furniture and layout is adequate
	One piece and chairs and tables adapted	>33-66% of furniture and layout is adequate
	Two pieces and chairs and tables adapted	>66-99% of furniture and layout is adequate
	All (three pieces & chairs & tables) adapted	100% of furniture and is adequate
Item 2 Adequacy of materials in centres	No centres have adequate material.	0% of centres have more than 50% adequate material
	Some centres " "	>0-33% of centres of centres have more than 50% adequate material
	Half centres " "	>33-66% of centres of centres have more than 50% adequate material
	Most centres " "	>66-99% of centres of centres have more than 50% adequate material
	All centres " "	100% of centres have more than 50% adequate material

(table continues)

Table T5. ***(continued)***

Item	Original scoring	Operationalised scoring
	Accessibility and Adequacy of the Physical Environment	
Item 3 Participation in centres	Child does not participate in four or more centres.	…100% of centres
	“ ” ..in three centres	…>66-99% of centres
	“ ” …two centres	…>33-66% of centres
	“ ” …one centre	…0-33% of centres
	“ ” …no centres	…0% of centres
Item 4	-	-
Item 5 Adequacy of outdoor physical environment	Stationary equipment not adapted and no supervision provided	0-<30% of equipment appropriate and no supervision provided
	Stationary equipment not adapted “ ”	30-<50% of equipment appropriate…“ ”
	Some stationary equipment appropriate…“ ”	50-85% of equipment appropriate…“ ”
	Stationary equipment and toys are appropriate…“ ”	85-100% of equipment and toys appropriate…“ ”
	Stationary equipment and toys are appropriate and adult supervision provided…“ ”	85-100% of equipment and toys appropriate and adult supervision provided.

(table continues)

Table T5. ***(continued)***

Item	Original scoring	Operationalised scoring
	Adult-child Contacts and Relationships	
Item 1 Degree of involvement of the adults with the child	Uninvolved	Greatest % of observations is uninvolved. ***Uninvolved:*** adult spends no time with child, though child is disengaged, involved independently or behaves inappropriately.
	Minimal involvement	Greatest % of observations is minimal involvement. ***Minimal involvement:*** adult provides some, though insufficient assistance (in level of activity allocated, prompts or cues) or spends some, though insufficient time with the child to be actively engaged, independent or behave appropriately
	Appropriate involvement	Greatest % of observations is appropriate involvement. ***Appropriate:*** adult provides sufficient assistance (in level of activity allocated, prompts or cues) or time to allow child to be actively engaged in activity, be independent, make own decisions and behave appropriately.
	Overly involved	Greatest % of observations is over involvement ***Over involvement::*** adult provides too much assistance (level of activity allocated, prompts or cues) or spends too much time with child so as to impede the child's active/ independent involvement.
	Excessively involved	Greatest % of observations are excessive involvement ***Excessive involvement****:* adult spends all time with the child and acts as barrier for child to involved in the activity at all and child is dependent on adult for all aspects.

(table continues)

Table T5. ***(continued)***

Item	Original scoring	Operationalised scoring
	Child-Child Contacts & Interactions	
Item 1: Affect of interactions	All negative	100% of interactions are negative
	Most negative, but some were neutral or positive	>33-66% of interactions are negative
	Some neutral, negative and positive interactions	15-33% of interactions are negative
	Most interactions were neutral or positive some negative	>75-99% of interactions are neutral or positive; 0-<15% of interactions are negative
	All interactions neutral or positive	100% of interactions are neutral or positive
Item 2: How often child-child interactions occur?	No interactions	No interactions
	Rarely (much fewer than appropriate)	Child interacted on >0-33% of appropriate occasions
	Sometimes (fewer than appropriate)	Child interacted >33-66% of appropriate occasions
	Regularly (slightly less than was appropriate)	Child interacted on >66-99% of appropriate occasions
	Frequently (at about appropriate level)	Child interacted on 100% of appropriate occasions
Item 3: Who is responsible for initiating interactions?	All initiated by observed child	100% of interactions initiated by observed child
	Most initiated by observed child	>66-99% of interactions initiated by observed child
	Balance of initiations by observed	>33-66% of interactions initiated by observed child

(table continues)

Table T5. ***(continued)***

Item	Original scoring	Operationalised scoring
	Child-Child Contacts & Interactions	
	All interactions initiated by others	100% of interactions initiated by other children
Item 4 & 5: Reciprocity of interactions	Child did not reciprocate any interactions	Reciprocated 0% of occasions
	Child rarely reciprocated interactions	Reciprocated >0-33% of occasions
	Child occasionally reciprocated…“ ”	Reciprocated on >33-66% of occasions
	Child frequently reciprocated…“ ”	Reciprocated >66-100% of occasions
	Child reciprocated all interactions (even when not appropriate to do so)	100% including inappropriate occasions
	Actual individualisation	
Item 5. Number of objectives addressed daily by activities		No changes
Item 6 Objectives addressed multiply throughout the day	No objective is addressed multiply throughout the day.	0% of objectives discussed are addressed multiply throughout the day
	Almost no objectives addressed…“ ”	>0-33% of objectives discussed are addressed…“ ”
	Some objectives addressed…“ ”	>33-66% of objectives discussed are addressed…“ ”
	Most objectives addressed…“ ”	>66-99% of objectives discussed are addressed…“ ”
	All objectives addressed…“ ”	100% of objectives discussed are addressed…“ ”

(table continues)

Table T5. ***(continued)***

Item	Original scoring	Operationalised scoring
	Actual Individualisation	
Item 7. Teacher's report of the extent to which all activities are used to teach some objectives	No activities, routines, or transitions are used to teach an objective.	0% of activities, routines, or transitions are used to teach an objective
	Almost no…" "	>0-33% activities, routines, or transitions are used …" "
	Some …" "	>33-66% activities, routines, or transitions are used …" "
	Most ….“ "	>66-99% activities, routines, or transitions are used … " "
	All... " "	100% activities, routines, or transitions are used …" "
Item 8. Teacher's description of strategies, procedures or environmental (social or physical) arrangements used to teach objectives	Teacher describes no strategies, procedures or arrangements for teaching objectives.	Unchanged.
	Teacher describes strategies… for almost no objectives	Teacher describes strategies.. for >0-33% objectives.
	" " … some objectives	" " … >33-66% objectives.
	" " … most objectives	" " … >66-99% objectives.
	" " … all objectives.	" " … 100% objectives.
Item 9. Teacher's report of the assignment of responsibility to teaching objectives of child with disabilities.	Teacher indicates no classroom staff member is assigned responsibility for teaching objectives.	Unchanged.
	" " some classroom staff is responsible for teaching almost no objectives	Teacher indicates some classroom staff member is assigned responsibility for teacher >0-33% objectives.

(table continues)

Table T5. ***(continued)***

Item	Original scoring	Operationalised scoring
	Actual Individualisation	
	“ ” …some objectives.	“ ” …>33-66% objectives.
	“ ” …most objectives.	“ ” …>66-99% objectives.
	“ ” …all objectives.	“ ” …100% objectives.
Item 10. Teacher report of implementation of generalisation plans	Teacher indicates no objectives have generalisation plans.	Unchanged.
	Teacher indicates almost no objective has a generalisation plan.	Teacher indicates >0-33% objectives have a generalisation plan
	“ ” …some objectives have a generalisation plan.	“ ” … >33-66% objectives have a generalisation plan.
	“ ” …most objectives have a generalisation plan.	“ ” …>66-99% objectives have a generalisation plan.
	“ ” …all objectives have a generalisation plan.	“ ” …100% objectives have a generalisation plan.
Item 11. Teacher’s report of monitoring for objective achievement	Teacher reports that no objectives are monitored for objective achievement	Teacher reports that no objectives are monitored for objective achievement
	… almost no objective is monitored…	“ ” … >0-33% objective is monitored for objective achievement
	“ ” …some objectives are monitored …“ ”	“ ” …>33-66% objectives are monitored for objective achievement

(table continues)

Table T5. ***(continued)***

Item	Original scoring	Operationalised scoring
	Actual Individualisation	
	…most objectives are monitored …	… >66-99% objectives are monitored for objective achievement
	… all objectives are monitored…	…100% objectives are monitored for objective achievement
Item 12. Teacher's report of involvement in monitoring	Teacher reports that classroom staff are not involved in monitoring progress	Average teacher rating = 0
	“ ” … not very involved …“ ”	Average teacher rating = 1-<2
	“ ” … somewhat involved …“ ”	Average teacher rating = 2-<3
	“ ” … very involved …“ ”	Average teacher rating = 3-<4
	“ ” … extremely involved …“ ”	Average teacher rating = 4
Item 13. Teacher's report of adjustments in the intervention/instruction	Teacher indicates adjustments were never made, or are made but not based on monitoring data.	Rating average=0-1
	“ ” … adjustments are rarely made	Rating average >1-2
	“ ” … adjustments sometimes made	Rating average >2-3
	“ ” … adjustments frequently made	Rating average >3-4
	“ ” …adjustments are made very frequently.	Rating average >4-5

(table continues)

APPENDIX U. INCLUSIVE OUTCOMES OF CLASSMATES WITH AND WITHOUT DISABILITIES, BY TIME PERIOD

Outcome Variable	Classmates with no disabilities		Classmates with disabilities		*U*	*p*
	Mdn	*IQR*	*Mdn*	*IQR*		
			Time 1[a]			
Participation	100.0	90.6, 100.0	100.0	100.0, 100.0	22.0	.457
Engagement	4.6	4.3, 4.8	4.8	4.7, 4.8	25.5	.587
Academic [b]	32.0	27.0, 36.0				
Child interaction	23.0	21.0, 24.0	23.5	23.0, 24.0	20.0	.954
			Time 2 [c]			
Participation	100.0	94.8, 100.0	100.0	100.0, 100.0	23.0	.396
Engagement	4.8	4.6, 4.9	4.9	4.8, 5.0	17.0	.269
Academic	33.0	30.2, 37.0	24.5	10.0, 41.0	29.5	.854
Child interaction						
			Time 3 [d]			
Participation	100.0	100.0, 100.0	100.0	100.0, 100.0	8.0	1.000
Engagement	4.7	4.6, 4.8	4.9	4.9, 4.9	8.0	1.000
Academic	33.0	28.0, 38.7	43.0	43.0, 43.0	2.0	.332
Child interaction	23.0	22.0, 23.8	21.0	21.0, 21.0		

Note. Classmates with disabilities comprised of one child with *barely noticeable* hearing impairment and another had transient juvenile arthritis that was *noticeable only after spending a long time with the child;* *U* = Mann-Whitney *U* value.
[a] Classmates with no disabilities n = 34 and Classmates with disabilities *n* = 2.
[b] Classmates with no disabilities n = 30 and Classmates with disabilities *n* = 0.
[c] Classmates with no disabilities n = 32 and Classmates with disabilities *n* = 2.
[d] Classmates with no disabilities n = 20 and Classmates with disabilities *n* = 1

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APPENDIX V. THREE STEP PROCESS TO SELECT INDIVIDUAL FACTORS INFLUENCING OUTCOMES ONE AND TWO YEARS LATER

Table V1. Step 1: Univariate logistic regression of successful participation of children with and without vision impairment one year later

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	Odds Ratio	95% CI	Group	Odds Ratio	95%CI
Social skills					
Classmates *good* [a]	35.02**	3.75, INF	Classmates *good* [b]	9.97**	1.82, 74.15
Classmates *poor* [a]	4.00	0.10, INF	Classmates *poor* [a]	1.00	0.03, INF
Children with vision impairment *good* [a]	3.89	0.41, INF	Children with vision impairment *poor* [a]	0.26	0.00, 2.44
Early intervention				12.52*	1.33, 182.30
Classmates (all) [b]	21.54***	2.89, 284.50	Classmates (all) [b]		
Children with vision impairment *less* [b]	1.70	0.19, 15.99	Children with vision impairment *more* [b]	0.59	0.06, 5.19
School attitude					
Classmates *good* [a]	21.50**	2.55, INF	Classmates *good* [a]	29.01**	3.12, INF
Classmates *poor* [b]	10.02*	1.22, 139.70	Classmates *poor* [b]	15.54*	1.46, 284.30
Children with vision impairment *good* [b]	0.62	0.04, 6.80	Children with vision impairment *poor* [b]	1.62	0.15, 25.26
Teacher attitude					
Classmates *good* [a]	31.22**	3.20, INF	Classmates *good* [b]	8.81*	1.28, 106.90
Classmates *poor* [a]	21.53**	2.00, INF	Classmates *poor* [b]	8.23	0.76, 449.60
Children with vision impairment *good* [a]	4.36	0.46, INF	Children with vision impairment *poor* [a]	0.23	0.00, 2.19

(table continues)

Table V1. ***(continued)***

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	OR	95% CI	Group	OR	95%CI
Staff support			Classmates *good* [b]		
Classmates *good* [b]	24.54**	2.02, 1467.00		20.55*	1.59, 1257.0
Classmates *poor* [b]	22.93**	1.87, 137	Classmates *poor* [b]	19.21*	1.47, 1179.0
Children with vision impairment *good* [b]	1.19	0.11, 13.47	Children with vision impairment *poor* [b]	0.842	0.07, 9.45
Individualisation			Classmates (all) [b]		
Classmates (all) [b]	22.22***	2.48, 333.60		11.18**	1.92, 87.2
Children with vision impairment *good* [b]	2.06	0.22, 29.41	Children with vision impairment *poor* [b]	0.48	0.03, 4.51
Teacher training & experience					
Classmates *good* [a]	32.74***	4.15 ,INF	Classmates *good* [a]	12.75*	1.19, INF
Classmates *poor* [b]	10.85**	1.73, 94.99	Classmates *poor* [b]	4.90	0.44, 60.51
Children with vision impairment *good* [b]	2.15	0.20, 24.73	Children with vision impairment *poor* [b]	0.46	0.04, 5.09
Vision aides & equipment					
Classmates (all) [b]	35.07***	4.57, 491.10	Classmates (all) [b]	9.25	0.51, 175.60
Children with vision impairment *good* [b]	3.56	0.16, 85.59	Children with vision impairment *poor* [b]	0.28	0.01, 6.11
Physical environment					
Classmates *good* [a]	45.83***	5.02, INF	Classmates *good* [a]	28.83***	3.73, INF
Classmates *poor* [b]	6.61	0.66, 106.90	Classmates *poor* [b]	3.32	0.50, 28.44
Children with vision impairment *good* [b]	2.06	0.22, 29.41	Children with vision impairment *poor* [b]	0.48	0.03, 4.51

(table continues)

Table V1. ***(continued)***

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	OR	95% CI	Group	OR	95%CI
Adult involvement					
Classmates *good* [b]	15.78**	2.37, 189.70	Classmates *good* [b]	21.55**	1.90, 400.40
Classmates *poor*	4.89	0.36, 294.80	Classmates *poor* [b]	6.44	0.32, 490.10
Children with vision impairment *good* [b]	0.68	0.046, 6.84	Children with vision impairment *poor* [b]	1.47	0.15, 21.50
Parent involvement					
Classmates *good* [a]	12.19*	1.21, INF	Classmates *good* [a]	7.63	0.87, INF
Classmates *poor* [b]	41.68**	3.02, 2709	Classmates *poor* [b]	22.87**	2.29, 1207
Children with vision impairment *good* [b]	2.06	0.22, 29.41	Children with vision impairment *poor* [b]	0.49	0.03, 4.51
Vision impairment severity					
Classmates (all) [b]	25.71*	1.58, 1676.00	Classmates (all) [b]	9.09	0.10, 835.90
Children with vision impairment *less* [b]	2.16	0.13, 137.50	Children with vision impairment *more* [b]	0.41	0.00, 52.13
Co-existing disability status					
Classmates *less* [b]	47.10***	4.05, 2752	Classmates *less* [b]	7.79*	1.30, 60.69
Classmates *more* [a]	6.74	0.443, INF	Classmates *more* [a]	1.74	0.12, INF
Children with vision impairment *less* [b]	6.36	0.53, 367.00	Children with vision impairment *more* [b]	0.16	0.00, 1.90
Socio-economic status					
Classmates *more* [a]	25.25**	3.08, INF	Classmates *more* [a]	12.75*	1.19, INF
Classmates *less* [a]	21.58**	2.61, INF	Classmates *less* [a]	10.91*	1.01, INF
Children with vision impairment *more* [b]	1.69	0.15, 20.06	Children with vision impairment *less* [b]	0.59	0.05, 6.72

Note. OR = Odds ratio; CI = Confidence interval; INF = Infinity.
[a] Median unbiased point estimate used. [b] Conditional likelihood function point estimate used.
*, p<.05. **, p<.01, ***p, <.001.

Table V2. Step 2 and 3: Mann Whitney *U* Tests of participation of children with and without vision impairment one year later

Factor that passed Step 1	*n*				Mann-Whitney *U* value					
					Step 2	Step 3				
						Group compared to *good* classmates		Group compared to *poor* classmates		Differential?
	Poor VI	*Good* VI	*Poor* CL	*Good* CL		*Poor* VI	*Good* VI	*Poor* VI	*Good* VI	
Stakeholder factor										
Social skills	4	15	1	31	3.0**	0.0***	76.5***	0.0	1.0	
Early intervention	12	8		29	30.5	30.5***	26.5***			
School attitude	10	7	17	14	34.5	12.0***	10.0**	23.5***	16.0**	
Teacher attitude	4	14	10	21	10.0	0.0***	44.0***	1.5**	25.0**	
Staff support	9	8	15	16	34.5	17.0***	17.0**	14.5**	13.0***	
Individualisation	7	13		34	38.5	17.0***	67.5***			
Teacher training & experience	13	6	19	14	32.0	2.0***	15.0**	28.5***	33.0	Yes
Vision aides & equipment	10	4		34	11.0	17.5***	28.5*			
Physical environment	7	13	12	22	37.5	3.0***	27.0***	12.5**	42.0*	
Adult involvement	14	6	5	28	31.5	35.0***	24.5**	15.0	6.0	
Parent involvement	7	13	23	6	39.5	5.0*	9.0**	15.5***	27.5***	
Demographic factor	4	14		34	19.0	6.0***	57.0***			
Vision impairment severity										
Co-existing disability status	7	13	2	32	24.0	10.5***	72.0***	0.0	2.0	
Socio-economic status	11	6	12	14	28.0	0.0***	14.0**	6.0***	17.0*	

Note. VI = Children with vision impairment; CL = Classmates; *Poor* = Children in *poor* or *more* conditions at Time 1; *Good* = Children in *good* or *less* conditions at Time 2;
Step 2 = Within-groups (children with vision impairment) comparison; Step 3 = Between-groups (children with vision impairment versus classmates).
*, p<.05. **, p<.01, ***p, <.001.

Table V3. Step 1: Univariate logistic regression of successful participation of children with and without vision impairment two years later

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	OR	95% CI	Group	OR	95% CI
Social skills					
Classmates *good* [a]	68.56**	5.32, INF	Classmates *good* [a]	20.11**	2.18, INF
Classmates *poor*	N/A	N/A	Classmates *poor*		
Children with vision impairment *good* [a]	2.84	0.24, INF	Children with vision impairment *poor* [a]	0.35	0.00, 4.16
Early intervention				6.33	0.16, INF
Classmates (all) [a]	56.13***	6.53, INF	Classmates (all) [a]		
Children with vision impairment *less* [b]	5.73	0.20, 470.30	Children with vision impairment *more* [b]	0.1744	0.00, 4.92
School attitude					
Classmates *good* [a]	6.29	0.56, INF	Classmates *good* [a]	12.27*	1.02, INF
Classmates *poor* [a]	10.91*	1.01, INF	Classmates *poor* [a]	21.23*	1.82, INF
Children with vision impairment *good* [b]	0.37	0.01, 8.60	Children with vision impairment *poor* [b]	2.687	0.12, 209.10
Teacher attitude					
Classmates *good* [a]	33.17*	2.07, INF	Classmates *good* [a]	15.03*	1.61, INF
Classmates *poor* [a]	8.69	0.51, INF	Classmates *poor* [a]	3.85	0.36, INF
Children with vision impairment *good* [a]	1.82	0.12, INF	Children with vision impairment *poor* [a]	0.55	0.00, 8.07
Staff support					
Classmates *good* [a]	11.96*	1.07, INF	Classmates *good* [a]	11.96*	1.07, INF
Classmates *poor* [a]	10.75	0.95, INF	Classmates *poor* [a]	10.75	0.95, INF
Children with vision impairment *good* [b]	1.00	0.04, 23.66	Children with vision impairment *poor* [b]	1	0.04, 23.66

(table continues)

Table V3. (*continued*)

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	OR	95% CI	Group	OR	95% CI
Individualisation					
Classmates (all) [a]	46.51**	2.92, INF	Classmates (all) [a]	32.44***	3.93, INF
Children with vision impairment *good* [a]	1.31	0.09, INF	Children with vision impairment *poor* [a]	0.76	0.00, 11.09
Teacher training & experience					
Classmates *good* [a]	14.29*	1.45, INF	Classmates *good* [a]	5.32	0.36, INF
Classmates *poor* [a]	29.01**	3.12, INF	Classmates *poor* [a]	10.74	0.75, INF
Children with vision impairment *good* [b]	2.29	0.10, 58.14	Children with vision impairment *poor* [b]	0.44	0.02, 10.14
Vision aides & equipment				-	-
Classmates (all) [a]	91.10***	9.96, INF	Classmates (all) [b]		
Children with vision impairment *good* [a]	3.50	0.09, INF	Children with vision impairment *poor* [a]	0.29	0.00, 11.14
Physical environment					
Classmates *good* [a]	55.43**	4.62, INF	Classmates *good* [a]	11.98*	1.27, INF
Classmates *poor* [a]	41.41**	3.39, INF	Classmates *poor* [a]	8.94	0.93, INF
Children with vision impairment *good* [a]	3.85	0.36, INF	Children with vision impairment *poor* [a]	0.26	0.00, 2.81
Adult Involvement					
Classmates *good* [a]	45.28***	5.12, INF	Classmates *good* [a]	13.84	0.98, INF
Classmates *poor* [a]	4.55	0.31, INF	Classmates *poor* [a]	1.45	0.08, INF
Children with vision impairment *good* [b]	2.71	0.12, 67.30	Children with vision impairment *poor* [b]	0.37	0.02, 8.32

(table continues)

Table V3. (*continued)*

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	OR	95% CI	Group	OR	95% CI
Parent involvement					
Classmates *good* [a]	6.74	0.44, INF	Classmates *good* [a]	11.18*	1.19, INF
Classmates *poor* [a]	14.76	1.00, INF	Classmates *poor* [a]	24.72**	2.85, INF
Children with vision impairment *good* [b]	1.00	0.04, 78.43	Children with vision impairment *poor* [b]	1.00	0.01, 27.88
Vision impairment severity					
Classmates (all) [a]	10.5	0.27, INF	Classmates (all) [a]	10.50	0.27, INF
Children with vision impairment *less* [b]	0.77	0.01, 78.30	Children with vision impairment *more* [a]	0.67	0.00, 26.00
Co-existing disability status					
Classmates *less* [a]	117.10***	10.46, INF	Classmates *less* [a]	14.73*	1.41, INF
Classmates *more* [a]	5.00	0.13, INF	Classmates *more* [a]	0.60	0.02, INF
Children with vision impairment *less* [a]	6.05	0.57, INF	Children with vision impairment *more* [a]	0.17	0.00, 1.75
Socio-economic status				3.00	0.08, INF
Classmates *more* [a]	18.50**	1.93, INF	Classmates *more* [a]		
Classmates *less* [a]	16.39*	1.69, INF	Classmates *less* [a]	2.67	0.07, INF
Children with vision impairment *more* [b]	4.17	0.14, 352.70	Children with vision impairment *less* [b]	0.24	0.00, 7.08

Note. OR = Odds ratio; CI = Confidence interval; INF = Infinity.
[a] Median unbiased point estimate used. [b] Conditional likelihood function point estimate used.
*, p<.05. **, p<.01, ***p, <.001.

Table V4. Step 2 and 3: Mann Whitney *U* Tests of participation of children with and without vision impairment two years later

Factor that passed Step 1	*n*				Mann-Whitney *U* value					
					Step 2	Step 3				
						Group compared to *good* classmates		Group compared to *poor* classmates		Differential?
	Poor VI	*Good* VI	*Poor* CL	*Good* CL		*Poor* VI	*Good* VI	*Poor* VI	*Good* VI	
Stakeholder factor	3	8		20	0.0**	0.0**	48.0			Yes
Social skills										
Early intervention	9	3		19	5.0	22.0***	22.0			Yes
School attitude	6	4	12	7	10.5	13.5	4.5	19.5*	6.5*	
Teacher attitude	2	8	4	15	2.0	0.0**	38.0	0.0	8.0	Yes
Staff support	5	5	9	10	11.0	10.0*	10.0*	12.0	12.0	
Individualisation	2	10		21	4.0	0.0**	50.0**			
Teacher training & experience	7	4	14	7	12.0	10.0	10.0	15.0**	15.0*	
Vision aides & equipment	8	1		21	0.5	12.5***	8.5			Yes
Physical environment	4	8	9	12	4.0*	0.0**	30.0	0.0**	20.0*	Yes
Adult involvement	8	4	2	18	7.0	22.0***	22.0	2.0	2.0	Yes
Parent involvement	3	9	13	6	9.5	3.0	9.0*	8.0*	24.0**	Yes
Demographic factor										
Co-existing disability status	5	7	1	20	0.0**	0.0***	48.0	0.0	2.0	Yes
Socio-economic status	7	3	8	9	7.0	12.0*	12.0	8.0**	8.0	Yes

Note. VI = Children with vision impairment; CL = Classmates; *Poor* = Children in *poor* or *more* conditions at Time 1; *Good* = Children in *good* or *less* conditions at Time 2;
Step 2 = Within-groups (children with vision impairment) comparison; Step 3 = Between-groups (children with vision impairment versus classmates).
*, p<.05. **, p<.01, ***p, <.001.

Table V5. Step 1: Univariate logistic regression of successful engagement of children with and without vision impairment one year later

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	OR	95% CI	Group	OR	95% CI
Social skills					
Classmates *good* [b]	33.56*	1.89, 2354.0	Classmates *good* [b]	5.06	0.62, 63.43
Classmates *poor* [a]	1.50	0.04, INF	Classmates *poor* [a]	0.33	0.01, INF
Children with vision impairment *good* [b]	7.25	0.44, 471.30	Children with vision impairment *poor* [b]	0.14	0.00, 2.28
Early intervention					
Classmates (all) [b]	7.48	0.88, 98.70	Classmates (all) [b]	4.42	0.27, 72.74
Children with vision impairment *less* [b]	1.67	0.16,24.77	Children with vision impairment *more* [b]	0.60	0.04, 6.14
School attitude					
Classmates *good* [b]	5.17	0.34, 314.40	Classmates *good* [b]	8.54	0.53, 549.90
Classmates *poor* [b]	6.34	0.43, 381.80	Classmates *poor* [b]	10.46	0.65, 667.80
Children with vision impairment *good* [b]	0.59	0.05, 6.72	Children with vision impairment *poor* [b]	1.69	0.15, 20.06
Teacher attitude					
Classmates *good* [b]	2.98	0.04, 77.02	Classmates *good* [b]	5.01	0.66, 62.30
Classmates *poor* [a]	2.50	0.06, INF	Classmates *poor* [a]	6.41	0.75, INF
Children with vision impairment *good* [b]	0.62	0.01, 10.42	Children with vision impairment *poor* [b]	1.62	0.10, 104.70
Staff support					
Classmates *good* [b]	3.31	0.30, 49.55	Classmates *good* [b]	3.92	0.34, 60.45
Classmates *poor* [a]	7.93	0.77, INF	Classmates *poor* [a]	9.22	0.89, INF
Children with vision impairment *good* [b]	0.84	0.07, 9.45	Children with vision impairment *poor* [b]	1.19	0.11, 13.47

(table continues)

Table V5. ***(continued)***

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	OR	95% CI	Group	OR	95% CI
Individualisation					
Classmates (all) [b]	18.49**	1.85, 289.70	Classmates (all) [b]	4.61	0.46, 62.54
Children with vision impairment *good* [b]	4.08	0.43, 48.69	Children with vision impairment *poor* [b]	0.25	0.02, 2.35
Teacher training & experience					
Classmates *good* [a]	10.02*	1.20, INF	Classmates *good* [a]	6.53	0.47, INF
Classmates *poor* [b]	5.02	0.65, 63.62	Classmates *poor* [b]	3.95	0.22, 71.26
Children with vision impairment *good* [b]	1.24	0.12, 18.58	Children with vision impairment *poor* [b]	0.81	0.05, 8.56
Vision aides & equipment					
Classmates (all) [b]	9.85*	1.13, 132.30	Classmates (all) [b]	4.96	0.07, 126.10
Children with vision impairment *good* [b]	1.91	0.102, 130.8	Children with vision impairment *poor* [b]	0.52	0.01, 9.80
Physical environment					
Classmates *good* [b]	23.08*	1.66, 1440.0	Classmates *good* [b]	5.96	0.42, 346.10
Classmates *poor* [b]	12.22	0.83, 785.50	Classmates *poor* [b]	3.15	0.21, 188.70
Children with vision impairment *good* [b]	4.08	0.43, 48.69	Children with vision impairment *poor* [b]	0.24	0.02, 2.35
Adult involvement					
Classmates *good* [a]	18.24*	2.26, INF	Classmates *good* [a]	13.12	0.96, INF
Classmates *poor* [b]	2.14	0.15, 131.00	Classmates *poor* [b]	1.88	0.07, 147.00
Children with vision impairment *good* [b]	1.11	0.11, 16.41	Children with vision impairment *poor* [b]	0.91	0.06, 9.44

(table continues)

Table V5. ***(continued)***

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	Odds Ratio	95% CI	Group	Odds Ratio	95% CI
Parent involvement					
Classmates *good* [a]	4.32	0.39, INF	Classmates *good* [a]	2.99	0.31, INF
Classmates *poor* [b]	7.15	0.62, 112.90	Classmates *poor* [b]	4.45	0.53, 57.63
Children with vision impairment *good* [b]	1.64	0.16, 16.17	Children with vision impairment *poor* [b]	0.61	0.06, 6.21
Vision Impairment severity					
Classmates (all) [b]	4.96	0.07, 126.10	Classmates (all) [b]	8.39*	1.15, 102.00
Children with vision impairment *good* [b]	0.62	0.01, 10.42	Children with vision impairment *poor* [b]	1.62	0.10, 104.70
Co-existing disability status					
Classmates *less* [b]	30.74**	3.04, 544.80	Classmates *less* [b]	2.66	0.17, 40.91
Classmates *more* [a]	3.78	0.25, INF	Classmates *more* [a]	0.368	0.02, INF
Children with vision impairment *less* [b]	11.48*	1.05, 214.90	Children with vision impairment *more* [b]	0.09*	0.01, 0.96
Socio-economic status					
Classmates *more* [a]	5.78	0.57, INF	Classmates *more* [a]	12.75*	1.19, INF
Classmates *les* [b]	3.88	0.26, 235.80	Classmates *less* [b]	9.28	0.54, 628.10
Children with vision impairment *more* [b]	0.40	0.03, 4.75	Children with vision impairment less [b]	2.51	0.21, 32.96

Note. OR = Odds ratio; CI = Confidence interval; INF = Infinity.

[a] Median unbiased point estimate used. [b] Conditional likelihood function point estimate used.

*, p<.05. **, p<.01, ***p, <.001.

Table V6. Step 2 and 3: Mann Whitney *U* Tests of engagement of children with and without vision impairment one year later

Factor that passed Step 1	*n*				Mann-Whitney *U* value					
					Step 2	Step 3				
	Poor VI	*Good* VI	*Poor* CL	*Good* CL		Group compared to *good* classmates		Group compared to *poor* classmates		Differential?
						Poor VI	*Good* VI	*Poor* VI	*Good* VI	
Stakeholder factor										
Social skills	4	15	1	31	15.0	14.5*	116.5**	1.0	7.0	
Individualisation	7	13		34	17.0*	17.0***	130.0*			
Teacher training & experience	13	6	19	14	37.0	23.0***	12.5*	67.0*	38.0	Yes
Vision aides & equipment	10	4		34	17.0	76.5**	17.5*			
Physical environment	7	13	12	22	29.0	16.0**	69.0*	13.0*	49.0	Yes
Adult involvement	14	6	5	28	30.0	45.0***	43.5	25.0	12.5	Yes
Demographic factor										
Vision impairment severity	4	14		34	23.0	29.0	98.0**			Yes
Co-existing disability status	7	13	2	32	18.0*	21.0***	124.5*	0.0	1.5*	Yes
Socio-economic status	11	6	12	14	25.0	22.0**	12.0*	36.0	16.0	

Note. VI = Children with vision impairment; CL = Classmates; *Poor* = Children in *poor* or *more* conditions at Time 1; *Good* = Children in *good* or *less* conditions at Time 2;
Step 2 = Within-groups (children with vision impairment) comparison; Step 3 = Between-groups (children with vision impairment versus classmates).
*, p<.05. **, p<.01, ***p, <.001.

Table V7. Step 1: Univariate logistic regression of successful engagement of children with and without vision impairment two years later

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	OR	95% CI	Group	OR	95% CI
Social skills					
Classmates *good* [a]	68.56**	5.32, INF	Classmates *good* [a]	6.72	0.50, INF
Classmates *poor*			Classmates *poor*		
Children with vision impairment *good* [a]	7.10	0.61, INF	Children with vision impairment *poor* [a]	0.14	0.00,1.64
Early intervention					
Classmates (all) [a]	24.2**	2.80, INF	Classmates (all) [a]	6.33	0.16, INF
Children with vision impairment *less* [b]	2.32	0.09, 176.50	Children with vision impairment *more* [b]	0.43	0.01, 11.32
School attitude					
Classmates *good* [a]	3.23	0.23, INF	Classmates *good* [a]	5.32	0.37, INF
Classmates *poor* [a]	5.59	0.40, INF	Classmates *poor* [a]	9.20	0.64, INF
Children with vision impairment *good* [b]	0.54	0.02, 13.01	Children with vision impairment *poor* [b]	1.86	0.08, 48.98
Teacher attitude					
Classmates *good* [a]	33.17*	2.07, INF	Classmates *good* [a]	5.03	0.37, INF
Classmates *poor* [a]	8.69	0.51, INF	Classmates *poor* [a]	1.31	0.09, INF
Children with vision impairment *good* [a]	4.55	0.31, INF	Children with vision impairment *poor* [a]	0.22	0.00, 3.23
Staff support					
Classmates *good* [a]	2.00	0.05, INF	Classmates *good* [a]	11.96*	1.07, INF
Classmates *poor* [a]	1.80	0.05, INF	Classmates *poor* [a]	10.75	0.95, INF
Children with vision impairment *good* [b]	0.20	0.03, 4.59	Children with vision impairment *poor* [b]	4.92	0.22, 392.00

(table continues)

Table V7. ***(continued)***

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	OR	95% CI	Group	OR	95% CI
Individualisation					
Classmates (all) [a]	10.50	0.27, INF	Classmates (all) [a]	22.45**	2.65, INF
Children with vision impairment *good* [b]	1.00	0.01, 94.01	Children with vision impairment *poor* [b]	1.00	0.01, 94.01
Teacher training & experience					
Classmates *good* [a]	8.57	0.85, INF	Classmates *good* [a]	1.75	0.05, INF
Classmates *poor* [a]	17.39*	1.82, INF	Classmates *poor* [a]	3.50	0.09, INF
Children with vision impairment *good* [b]	3.52	0.17, 261.50	Children with vision impairment *poor* [b]	0.28	0.00, 5.90
Vision aides & equipment					
Classmates (all) [a]	33.20***	3.76, INF	Classmates (all) [b]		
Children with vision impairment *good* [a]	1.25	0.03, INF	Children with vision impairment *poor* [a]	0.80	0.00, 31.20
Physical environment					
Classmates *good* [a]	21.23*	1.82, INF	Classmates *good* [a]	7.36	0.70, INF
Classmates *poor* [a]	15.85*	1.34, INF	Classmates *poor* [a]	5.49	0.52, INF
Children with vision impairment *good* [b]	4.34	0.22, 313.90	Children with vision impairment *poor* [b]	0.23	0.00, 4.50
Adult involvement					
Classmates *good* [a]	28.41**	3.20, INF	Classmates *good* [a]	4.50	0.12, INF
Classmates *poor* [a]	2.85	0.20, INF	Classmates *poor* [a]	0.50	0.013, INF
Children with vision impairment *good* [b]	4.34	0.22, 313.90	Children with vision impairment *poor* [b]	0.23	0.00, 4.50

(table continues)

Table V7. ***(continued)***

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	OR	95% CI	Group	OR	95% CI
Parent involvement					
Classmates *good* [a]	2.00	0.05, INF	Classmates *good* [a]	7.45	0.78, INF
Classmates *poor* [a]	4.33	0.11, INF	Classmates *poor* [a]	16.47**	1.87, INF
Children with vision impairment *good* [b]	0.43	0.01, 11.32	Children with vision impairment *poor* [b]	2.32	0.09, 176.50
Vision Impairment severity					
Classmates (all) [a]	10.50	0.27, INF	Classmates (all) [a]	10.50	0.27, INF
Children with vision impairment *less* [b]	1.29	0.01, 130.50	Children with vision impairment *more* [b]	0.58	0.00, 78.17
Co-existing disability stats					
Classmates *less* [a]	48.35***	4.68, INF	Classmates *less* [a]	7.82	0.58, INF
Classmates *more* [a]	2.00	0.05, INF	Classmates *more* [a]	0.33	0.01, INF
Children with vision impairment *less* [b]	7.96	0.43, 588.30	Children with vision impairment *more* [b]	0.13	0.00, 2.32
Socio-economic status					
Classmates *more* [a]	11.09*	1.13, INF	Classmates *more* [a]	3.00	0.08, INF
Classmates *less* [a]	9.83	1.00, INF	Classmates *less* [a]	2.67	0.07, INF
Children with vision impairment *more* [b]	2.41	0.09, 196.00	Children with vision impairment *less* [b]	0.41	0.01, 11.80

Note. OR = Odds ratio; CI = Confidence interval; INF = Infinity.
[a] Median unbiased point estimate used. [b] Conditional likelihood function point estimate used.
*, p<.05. **, p<.01, ***p, <.001.

Table V8. Step 2 and 3: Mann Whitney *U* Tests of engagement of children with and without vision impairment two years later

Factor that passed Step 1	*n*				Mann-Whitney *U* value					
						Step 3				
	Poor VI	*Good* VI	*Poor* CL	*Good* CL	Step 2	Group compared to *good* classmates		Group compared to *poor* classmates		Differential?
						Poor VI	*Good* VI	*Poor* VI	*Good* VI	
Stakeholder factor Social skills	3	8		20	3.0	0.0*	49.0			Yes
Early intervention	9	3		19	9.0	17.0***	28.0			Yes
Teacher attitude	2	8	4	15	4.0	0.0*	33.0	0.0	12.0	Yes
Staff Support	5	5	9	10	9.0	11.0	15.0	6.0*	14.0	Yes
Individualisation	2	10		21	7.0	0.0**	52.0*			
Teacher training & experience	7	4	14	7	10.0	10.0	4.0	23.0	15.0	
Vision aides & equipment	8	1		21	0.0	15.0***	2.0			Yes
Physical environment	4	8	9	12	11.0	0.0**	30.0	0.0**	22.0	Yes
Adult involvement	8	4	2	18	11.0	21.0**	29.0	2.0	0.0	Yes
Parent involvement	3	9	13	6	13.0	6.0	13.0	7.0	20.0**	Yes
Demographic factor										
Co-existing disability status	5	7	1	20	10.0	0.0***	52.0	0.0	0.0	Yes
Family income	7	3	8	9	9.0	14.0	6.0	13.0	14.0*	Yes

Note. VI = Children with vision impairment; CL = Classmates; *Poor* = Children in *poor* or *more* conditions at Time 1; *Good* = Children in *good* or *less* conditions at Time 2;
Step 2 = Within-groups (children with vision impairment) comparison; Step 3 = Between-groups (children with vision impairment versus classmates).
*, p<.05. **, p<.01, ***p, <.001.

Table V9. Step 1: Univariate logistic regression of successful interaction of children with and without vision impairment one year later

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	OR	95% CI	Group	OR	95% CI
Social skills					
Classmates *good* [a]	72.74***	7.12, INF	Classmates *good* [b]	10.28	0.89, 554.50
Classmates *poor* [a]	4.00	0.10, INF	Classmates *poor* [a]	0.33	0.01, INF
Children with vision impairment *good* [a]	10.97*	1.16, INF	Children with vision impairment *poor* [a]	0.09*	0.00, 0.87
Early intervention					
Classmates (all) [b]	21.61**	1.96, 1180.0	Classmates (all) [b]	15.46*	1.03, 943.20
Children with vision impairment *less* [b]	1.37	0.16, 13.59	Children with vision impairment *more* [b]	0.73	0.07, 6.40
School attitude					
Classmates *good* [a]	10.10*	1.14, INF	Classmates *good* [a]	10.27	0.98, INF
Classmates *poor* [b]	9.65	0.76, 557.10	Classmates *poor* [b]	10.46	0.65, 667.80
Children with vision impairment *good* [b]	0.90	0.09, 9.77	Children with vision impairment *poor* [b]	1.117	0.10, 11.63
Teacher attitude					
Classmates *good* [a]	48.35***	4.68, INF	Classmates *good* [b]	5.19	0.37, 300.30
Classmates *poor* [a]	46.09**	3.80, INF	Classmates *poor* [a]	3.09	0.30, INF
Children with vision impairment *good* [a]	13.61*	1.403, INF	Children with vision impairment *poor* [a]	0.07*	0.00, 0.71
Staff support					
Classmates *good* [a]	13.44*	1.47, INF	Classmates *good* [a]	9.85	0.95, INF
Classmates *poor* [b]	9.96	0.76, 589.60	Classmates *poor* [b]	7.54	0.48, 471.50
Children with vision impairment *good* [b]	1.31	0.13, 14.27	Children with vision impairment *poor* [b]	0.76	0.07, 7.55

(table continues)

Table V9. (*continued)*

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	OR	95% CI	Group	OR	95% CI
Individualisation					
Classmates (all) [b]	21.38*	1.38, 1336.0	Classmates (all) [b]	25.58**	2.55, 1338.0
Children with vision impairment *good* [b]	0.88	0.09, 7.83	Children with vision impairment *poor* [b]	1.14	0.13, 11.13
Teacher training & experience					
Classmates *good* [b]	10.16	0.95, 550.90	Classmates *good* [b]	5.80	0.24, 412.10
Classmates *poor* [a]	18.58**	2.34, INF	Classmates *poor* [a]	8.88	0.65, INF
Children with vision impairment *good* [b]	1.67	0.16, 24.77	Children with vision impairment *poor* [b]	0.60	0.04, 6.14
Vision aides & equipment					
Classmates (all) [b]	41.97***	3.84, 2340.0	Classmates (all) [b]	9.67	0.11, 888.10
Children with vision impairment *good* [b]	4.03	0.23, 274.80	Children with vision impairment *poor* [b]	0.25	0.00, 4.44
Physical environment					
Classmates *good* [b]	23.08*	1.66, 1440.0	Classmates *good* [b]	12.08*	1.12, 649.30
Classmates *poor* [a]	14.87*	1.54, INF	Classmates *poor* [a]	8.57*	1.01, INF
Children with vision impairment *good* [b]	2.05	0.23, 20.76	Children with vision impairment *poor* [b]	0.49	0.05, 4.31
Adult involvement					
Classmates *good* [b]	31.97***	3.35, 1653.0	Classmates *good* [b]	5.02	0.06, 439.00
Classmates *poor* [a]	7.23	0.81, INF	Classmates *poor* [a]	0.83	0.02, INF
Children with vision impairment *good* [b]	6.07	0.49, 353.80	Children with vision impairment *poor* [b]	0.17	0.00, 2.06

(table continues)

Table V9. (*continued*)

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	OR	95% CI	Group	OR	95% CI
Parent involvement					
Classmates *good* [a]	7.31	0.71, INF	Classmates *good* [a]	4.20	0.46, INF
Classmates *poor* [b]	24.16*	1.74, 1506.0	Classmates *poor* [b]	12.65*	1.17, 678.80
Children with vision impairment *good* [b]	2.05	0.23, 20.76	Children with vision impairment *poor* [b]	0.49	0.05, 4.31
Vision impairment severity	23.69	0.21,		23.69	0.21, 2660.0
Classmates (all) [b]		2660.00	Classmates (all) [b]		
Children with vision impairment *less* [b]	1.31	0.01, 117.60	Children with vision impairment *more* [b]	1.00	0.01, 117.30
Co-existing disability status					
Classmates *less* [b]	58.53***	4.32, 3770.0	Classmates *good*	12.81*	1.10, 699.50
Classmates *more* [a]	3.78	0.25, INF	Classmates *poor* [a]	0.912	0.06, INF
Children with vision impairment *less* [b]	5.107	0.54, 76.45	Children with vision impairment *more* [b]	0.20	0.01, 1.84
Socio-economic status				5.80	0.24, 412.10
Classmates *more* [b]	13.74*	1.22, 770.80	Classmates *more* [b]		
Classmates *less* [a]	15.41**	1.84, INF	Classmates *less* [a]	5.60	0.40, INF
Children with vision impairment *more* [b]	2.28	0.21, 35.67	Children with vision impairment *less* [b]	0.44	0.00, 4.73

Note. OR = Odds ratio; CI = Confidence interval; INF = Infinity.
[a] Median unbiased point estimate used. [b] Conditional likelihood function point estimate used.
*, p<.05. **, p<.01, ***p, <.001.

Table V10. Step 2 and 3: Mann Whitney *U* Tests of child interaction of children with and without vision impairment one year later

Factor that passed Step 1	*n*				Mann-Whitney *U* value					
					Step 2	Step 3				
	Poor VI	*Good* VI	*Poor* CL	*Good* CL		Group compared to good classmates		Group compared to poor classmates		Differential
						Poor VI	*Good* VI	*Poor* VI	*Good* VI	
Stakeholder factor										
Social skills	4	15	1	31	1.0***	0.5***	94**	0.0	5.0	
Early intervention	12	8		29	30.5	34.5***	54.5*			
School attitude	10	7	17	14	34.0	20.5**	9.5**	35.0**	17.5**	
Teacher attitude	4	14	10	21	5.0**	2.0***	67**	0.0**	24.5**	
Staff Support	9	8	15	16	34.0	26.0**	19.5**	22.5**	14.5**	
Individualisation	7	13		34	44.0	27.5*	78***			
Teacher training & experience	13	6	19	14	34.5	19.5***	19*	36.0***	27.5	Yes
Vision aides & equipment	10	4		34	9.5	27.5***	22.5*			
Physical environment	7	13	12	22	37.0	16.0**	49.0**	10.0**	30.5**	
Adult involvement	14	6	5	28	19.0	38.5**	49.0	7.5**	10.0	Yes
Parent involvement	7	13	23	6	42.0	7.5*	11.0*	31.5*	39.0***	
Demographic factor										
Co-existing disability status	7	13	2	32	20.0*	14.0***	88.5**	0.0	3.0	
Socio-economic status	11	6	12	14	27.5	16.5***	20.0	16.0**	17.0	Yes

Note. VI = Children with vision impairment; CL = Classmates; *Poor* = Children in *poor* or *more* conditions at Time 1; *Good* = Children in *good* or *less* conditions at Time 2;
Step 2 = Within-groups (children with vision impairment) comparison; Step 3 = Between-groups (children with vision impairment versus classmates).
*, p<.05. **, p<.01, ***p, <.001.

Table V11. Step 1: Univariate logistic regression of successful interaction of children with and without vision impairment two years later

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	OR	95% CI	Group	OR	95% CI
Social Skills					
Classmates *good* [b]	14.31	0.54, 1118.0	Classmates *good* [b]	1.27	0.02, 28.34
Classmates *poor*			Classmates *poor*		
Children with vision impairment *good* [b]	9.77	0.29, 939.50	Children with vision impairment *poor* [b]	0.10	0.00, 3.43
Early Intervention	8.19	0.54, 497.80		7.55	0.08, 744.00
Classmates (all) [b]			Classmates (all) [b]		
Children with vision impairment *less* [b]	1.00	0.04, 78.43	Children with vision impairment *more* [b]	1.00	0.01, 27.88
School Attitude	1.17	0.03, INF		1.75	0.05, INF
Classmates *good* [a]			Classmates *good* [a]		
Classmates *poor* [b]	2.10	0.02, 188.10	Classmates *poor* [b]	3.32	0.04, 313.40
Children with vision impairment *good* [b]	0.63	0.01, 62.65	Children with vision impairment *poor* [b]	1.58	0.02, 156.60
Teacher Attitude	9.97	0.70, INF		0.75	0.00, 10.14
Classmates *good* [a]			Classmates *good* [a]		
Classmates *poor* [a]	8.69	0.51, INF	Classmates *poor* [b]	-	-
Children with vision impairment *good* [a]	17.59*	1.08, INF	Children with vision impairment *poor* [a]	0.06*	0.00, 0.93

(table continues)

Table V11. (*continued*)

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	OR	95% CI	Group	OR	95% CI
Staff support					
Classmates *good* [b]	2.12	0.02, 195.90	Classmates *good* [b]	2.12	0.02, 195.90
Classmates *poor* [a]	1.80	0.05, INF	Classmates *poor* [a]	1.80	0.05, INF
Children with vision impairment *good* [b]	1.00	0.01, 97.90	Children with vision impairment *poor* [b]	1.00	0.01, 97.90
Individualisation					
Classmates (all) [a]	4.52	0.00, 71.90	Classmates (all) [b]	5.89	0.66, 80.80
Children with vision impairment *good* [a]	0.77	0.00, 11.09	Children with vision impairment *poor* [a]	1.31	0.09, INF
Teacher training & experience					
Classmates *good* [a]	2.70	0.19, INF	Classmates *good*	1.75	0.05, INF
Classmates *poor* [b]	2.29	0.13, 40.43	Classmates *poor* [b]	1.91	0.03, 50.57
Children with vision impairment *good* [b]	1.18	0.04, 94.10	Children with vision impairment *poor* [b]	0.85	0.01, 24.09
Vision aides & equipment					
Classmates (all) [b]	5.28	0.47, 80.10	Classmates (all) [a]	10.00	0.00, 390.00
Children with vision impairment *good* [a]	0.50	0.01, INF	Children with vision impairment *poor* [a]	2.00	0.00, 78.00
Physical environment					
Classmates *good* [a]	9.20	0.64, INF	Classmates *good* [a]	4.02	0.29, INF
Classmates *poor* [b]	3.14	0.14, 76.45	Classmates *poor* [b]	1.16	0.06, 20.75
Children with vision impairment *good* [b]	2.71	0.10, 67.30	Children with vision impairment *poor* [b]	0.37	0.02, 8.32

(table continues)

Table V11. (*continued*)

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	OR	95% CI	Group	OR	95% CI
Adult involvement					
Classmates *good* [b]	14.66*	1.10, 884.20	Classmates *good* [a]	4.50	0.00, 175.50
Classmates *poor* [b]	1.00	0.01, 97.90	Classmates *poor* [a]	0.50	0.00, 19.50
Children with vision impairment *good* [a]	3.85	0.36, INF	Children with vision impairment *poor* [a]	0.26	0.00, 2.81
Parent involvement					
Classmates *good* [a]	2.00	0.05, INF	Classmates *good* [a]	3.11	0.29, INF
Classmates *poor* [b]	5.10	0.05, 509.00	Classmates *poor* [b]	5.50	0.36, 340.60
Children with vision impairment *good* [b]	1.00	0.01, 27.88	Children with vision impairment *poor* [b]	1.00	0.04, 78.43
Vision impairment severity					
Classmates (all) [b]	7.96	0.08, 783.10	Classmates (all) [b]	7.96	0.08, 783.10
Children with vision impairment *less* [b]	2.24	0.02, 234.80	Children with vision impairment *more* [b]	1.73	0.01, 234.50
Co-existing disability status					0
Classmates *less* [b]	1.73	0.01, 234.50	Classmates *less* [b]	2.24	.02, 234.80
Classmates *more* [b]	11.41	0.82, 230.30	Classmates *more* [b]	1.48	0.02, 33.45
Children with vision impairment *less* [a]	1.00	0.03, INF	Children with vision impairment *more* [a]	0.14	0.00, INF
Socio-economic status					
Classmates *more* [b]	7.22	0.35, 549.00	Classmates *more* [b]	0.14	0.00, 2.84
Classmates *less* [a]	11.09*	1.13, INF	Classmates *less* [b]	-	-
Children with vision impairment *more* [a]	9.83	1.00, INF	Children with vision impairment *less* [b]	-	-

Note. OR = Odds ratio; CI = Confidence interval; INF = Infinity.
[a] Median unbiased point estimate used. [b] Conditional likelihood function point estimate used.
*, p<.05. **, p<.01, ***p, <.001.

Table V12. Step 2 and 3: Mann Whitney *U* Tests of child interaction of children with and without vision impairment two years later

Factor that passed Step 1	*n*				Mann-Whitney *U* value					
					Step 2	Step 3				
	Poor VI	*Good* VI	*Poor* CL	*Good* CL		Group compared to *good* classmates		Group compared to *poor* classmates		Differential?
						Poor VI	*Good* VI	*Poor* VI	*Good* VI	
Stakeholder factor										
Teacher attitude	2	8	4	15	0.0*	0.0*	43.0	0.0	6.0	Yes
Adult involvement	8	4	2	18	4.6	16.0**	28.5	5.0	3.2	Yes
Demographic factor										
Socio-economic status	7	3	8	9	5.0	9.5*	9.0	3.5**	3.5	Yes

Note. VI = Children with vision impairment; CL = Classmates; *Poor* = Children in *poor* or *more* conditions at Time 1; *Good* = Children in *good* or *less* conditions at Time 2;
Step 2 = Within-groups (children with vision impairment) comparison; Step 3 = Between-groups (children with vision impairment versus classmates).
*, p<.05. **, p<.01, ***p, <.001.

Table V13. Step 1: Univariate logistic regression of successful academic performance of children with and without vision impairment one year later

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	OR	95% CI	Group	OR	95% CI
Social skills					
Classmates *good* [a]	47.8***	4.95, INF	Classmates *good* [b]	3.51	0.36, 47.09
Classmates *poor* [b]			Classmates *poor* [a]	0.33	0.00, 13
Children with vision impairment *good* [a]	14.87*	1.54, INF	Children with vision impairment *poor* [a]	0.07*	0.00, 0.65
Early intervention					
Classmates (all) [b]	7.30*	1.23, 50.96	Classmates (all) [b]	0.93	0.02, 11.67
Children with vision impairment *less* [b]	7.49	0.60, 440.30	Children with vision impairment *more* [b]	0.13	0.00, 1.66
School attitude					
Classmates *good* [b]	7.87	0.61, 458.70	Classmates *good* [b]	4.75	0.21, 329.80
Classmates *poor* [b]	4.67	0.53, 64.94	Classmates *poor* [b]	2.85	0.17, 49.49
Children with vision impairment *good* [b]	1.62	0.15, 25.26	Children with vision impairment *poor* [b]	0.62	0.04, 6.80
Teacher attitude					
Classmates *good* [a]	37.36**	3.26, INF	Classmates *good* [a]	6.57	0.66, INF
Classmates *poor*	9.51	0.49, 706.00	Classmates *poor* [b]	1.09	0.10, 15.91
Children with vision impairment *good* [b]	9.28	0.54, 628.10	Children with vision impairment *poor* [b]	0.11	0.00, 1.87

(table continues)

Table V13. (*continued*)

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	OR	95% CI	Group	OR	95% CI
Staff support					
Classmates *good* [b]	10.66	0.82, 629.00	Classmates *good* [b]	4.63	0.21, 314.10
Classmates *poor* [b]	4.81	0.51, 69.55	Classmates *poor* [b]	2.09	0.12, 35.61
Children with vision impairment *good* [b]	2.28	0.21, 35.67	Children with vision impairment *poor* [b]	0.44	0.03, 4.73
Individualisation					
Classmates (all) [b]	2.90	0.21, 27.87	Classmates (all) [b]	6.11*	1.12, 38.55
Children with vision impairment *good* [b]	0.48	0.03, 4.51	Children with vision impairment *poor* [b]	2.06	0.22, 29.41
Teacher training & experience					
Classmates *good* [a]	10.02*	1.20, INF	Classmates *good* [a]	6.53	0.47, INF
Classmates *poor* [b]	3.20	0.48, 26.15	Classmates *poor* [b]	2.55	0.16, 31.95
Children with vision impairment *good* [b]	1.24	0.12, 18.58	Children with vision impairment *poor* [b]	0.81	0.05, 8.56
Vision aides & equipment					
Classmates (all) [b]	10.37**	1.68, 78.66	Classmates (all) [b]	2.42	0.04, 40.78
Children with vision impairment *good* [b]	4.03	0.23, 274.80	Children with vision impairment *poor* [b]	0.25	0.01, 4.44
Physical environment					
Classmates *good* [b]	11.63*	1.14, 185.60	Classmates *good* [b]	4.24	0.50, 55.06
Classmates *poor* [b]	5.91	0.54, 98.77	Classmates *poor* [b]	2.15	0.24, 29.30
Children with vision impairment *good* [b]	2.83	0.31, 30.18	Children with vision impairment *poor* [b]	0.35	0.03, 3.21

(table continues)

Table V13. (*continued)*

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	OR	95% CI	Group	OR	95% CI
Adult involvement					
Classmates *good* [b]	7.84*	1.36, 59.72	Classmates *good* [b]	1.64	0.03, 26.12
Classmates *poor* [b]	3.73	0.27, 224.6	Classmates *poor* [b]	0.82	0.01, 78.33
Children with vision impairment *good* [b]	4.63	0.37, 269.60	Children with vision impairment *poor* [b]	0.22	0.00, 2.71
Parent involvement					
Classmates *good* [b]	2.47	0.18 ,46.59	Classmates *good* [b]	0.89	0.08, 13.82
Classmates *poor* [b]	12.21*	1.20, 194.30	Classmates *poor* [b]	4.45	0.53, 57.63
Children with vision impairment *good* [b]	2.83	0.31, 30.18	Children with vision impairment *poor* [b]	0.35	0.03, 3.21
Vision impairment severity					
Classmates (all) [b]	19.46*	1.25, 122	Classmates (all) [b]	2.92	0.46, 19.02
Children with vision impairment *less* [b]	6.61	0.396, 432	Children with vision impairment *more* [b]	0.15	0.00, 2.52
Co-existing disability status					
Classmates *less* [b]	20.8**	2.313, 313	Classmates *less* [b]	2.82	0.33, 24.73
Classmates *more* [b]	2.24	0.02, 234.80	Classmates *more* [b]	0.33	0.00, 31.34
Children with vision impairment *less* [b]	7.32	0.74, 117.20	Children with vision impairment *more* [b]	0.14	0.01, 1.35
Socio-economic status					
Classmates *more* [b]	13.74*	1.22, 770.80	Classmates *more* [b]	2.46	0.03, 219.50
Classmates *less* [b]	3.39	0.47, 31.15	Classmates *less* [b]	0.62	0.01, 10.42
Children with vision impairment *more* [b]	5.40	0.40, 330.10	Children with vision impairment *less* [b]	0.19	0.00, 2.52

Note. OR = Odds ratio; CI = Confidence interval; INF = Infinity.
[a] Median unbiased point estimate used. [b] Conditional likelihood function point estimate used.
*, p<.05. **, p<.01, ***p, <.001.

Table V14. Step 2 and 3: Mann Whitney *U* Tests of academic performance of children with and without vision impairment one later

Factor that passed Step 1	*n*				Mann-Whitney *U* value					
					Step 2	Step 3				
	Poor VI	*Good* VI	*Poor* CL	*Good* CL		Group compared to *good* classmates		Group compared to *poor* classmates		Differential?
						Poor VI	*Good* VI	*Poor* VI	*Good* VI	
Stakeholder factor										
Social skills	4	15	1	31	0.5**	0.0**	198.0	1.0	0.0	Yes
Early intervention	12	8		29	31.5	101.5*	100.5			Yes
Teacher attitude	4	14	10	21	10.0	10.0*	124.0	7.0	65.0	Yes
Individualisation	7	13		34	44.5	82.5	163.0			
Teacher training & experience	13	6	19	14	39.0	47.0*	22.0	105.5	50.5	Yes
Vision aides & equipment	10	4		34	8.5	86.0*	46.5			Yes
Physical environment	7	13	12	22	26.0	22.5**	123.0	18.0*	74.0	Yes
Adult involvement	14	6	5	28	29.0	121.5*	68.5	34.0	10.5	Yes
Parent involvement	7	13	23	6	25.0	10.0	37.5	26.0**	125.5	Yes
Demographic factor										
Vision impairment severity	4	14		34	14.0	26.5*	211.5			Yes
Co-existing disability status	7	13	2	32	15.0*	20.5***	205.0	6.5	12.5	Yes
Socio-economic status	11	6	12	14	27.5	0.0***	30.0	50.0		Yes

Note. VI = Children with vision impairment; CL = Classmates; *Poor* = Children in *poor* or *more* conditions at Time 1; *Good* = Children in *good* or *less* conditions at Time 2;
Step 2 = Within-groups (children with vision impairment) comparison; Step 3 = Between-groups (children with vision impairment versus classmates).
*, p<.05. **, p<.01, ***p, <.001.

Table V15. Step 1: Univariate logistic regression of successful academic performance of children with and without vision impairment two years later

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	OR	95% CI	Group	OR	95% CI
Social skills					
Classmates *good* [b]	14.31	0.54, 1118. 0	Classmates *good* [b]	2.87	0.17, 47.99
Classmates *poor*	N/A	N/A	Classmates *poor*	N/A	N/A
Children with vision impairment *good* [b]	4.95	0.17, 411.50	Children with vision impairment *poor* [b]	0.20	0.00, 5.80
Early intervention					
Classmates (all) [b]	15.51*	1.16, 933.40	Classmates (all) [b]	5.34	0.06, 496.30
Children with vision impairment *less* [b]	2.74	0.14, 196.20	Children with vision impairment *more* [b]	0.37	0.00, 7.20
School attitude					
Classmates *good* [b]	1.18	0.01, 109.70	Classmates *good* [a]	10.48	0.80, INF
Classmates *poor* [a]	2.00	0.05, INF	Classmates *poor* [a]	40.96**	3.13, INF
Children with vision impairment *good* [a]	0.12	0.00, 1.44	Children with vision impairment *poor* [a]	8.69	0.69, INF
Teacher attitude					
Classmates *good* [a]	7.50	0.00, 292.50	Classmates *good* [b]	7.54	0.48, 471.50
Classmates *poor* [b]	-	-	Classmates *poor* [a]	2.37	0.20, INF
Children with vision impairment *good* [a]	0.89	0.00, 13.39	Children with vision impairment *poor* [a]	1.13	0.08, INF

(table continues)

Table V15. (*continued)*

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	OR	95% CI	Group	OR	95% CI
Staff support					
Classmates *good* [b]	2.12	0.02, 195.90	Classmates *good* [b]	18.03	0.78, 157
Classmates *poor* [a]	1.80	0.05, INF	Classmates *poor* [a]	15.85*	1.34, INF
Children with vision impairment *good* [b]	0.12	0.00, 3.26	Children with vision impairment *poor* [b]	8.35	0.30, 783.00
Individualisation					
Classmates (all) [b]	4.31	0.05, 129.60	Classmates (all) [b]	6.97	0.76, 98.57
Children with vision impairment *good* [b]	0.65	0.01, 17.23	Children with vision impairment *poor* [b]	1.54	0.06, 117.70
Teacher training & experience					
Classmates *good* [a]	5.07	0.46, INF	Classmates *good* [a]	1.75	0.05, INF
Classmates *poor* [b]	4.14	0.34, 67.48	Classmates *poor* [b]	1.91	0.03, 50.57
Children with vision impairment *good* [b]	2.10	0.10, 156.90	Children with vision impairment *poor* [b]	0.48	0.01, 10.52
Vision aides & equipment					
Classmates (all) [b]	11.06*	1.08, 176.90	Classmates (all) [a]	10.00	0.00, 390.00
Children with vision impairment *good* [a]	1.00	0.03, INF	Children with vision impairment *poor* [a]	1.00	0.00, 39.00
Physical environment					
Classmates *good* [a]	6.95	0.50, INF	Classmates *good* [a]	8.78	0.83, INF
Classmates *poor* [b]	2.19	0.11, 45.42	Classmates *poor* [b]	2.47	0.19, 42.25
Children with vision impairment *good* [b]	0.90	0.05, 14.85	Children with vision impairment *poor* [b]	1.11	0.07, 22.01

(table continues)

Table V15. (*continued)*

Compared to children with vision impairment of *poor* or *more* status			Compared to children with vision impairment of *good* or *less* status		
Stakeholder factor and group	OR	95% CI	Group	OR	95% CI
Adult involvement					
Classmates *good* [b]	3.77	0.34, 55.99	Classmates *good* [b]	12.75	0.48, 999.8
Classmates *poor* [a]	0.97	0.06, INF	Classmates *poor* [a]	2.16	0.12, INF
Children with vision impairment *good* [b]	0.28	0.00, 7.54	Children with vision impairment *poor* [b]	3.53	0.13, 274.50
Parent involvement					
Classmates *good* [b]	7.12	0.20, 704.50	Classmates *good*	2.36	0.13, 157.10
Classmates *poor* [a]	14.76	1.00, INF	Classmates *poor* [a]	6.86	0.66, INF
Children with vision impairment *good* [b]	3.53	0.13, 74.50	Children with vision impairment *poor* [b]	0.28	0.00, 7.54
Vision impairment severity					
Classmates (all) [a]	4.52	0.00, 71.90	Classmates (all) [a]	4.52	0.00, 71.90
Children with vision impairment *less* [a]	1.37	0.00, 22.46	Children with vision impairment *more* [a]	0.16	0.00, 2.74
Co-existing disability status					
Classmates *less* [b]	5.43	0.29, 105.10	Classmates *less* [b]	6.15	0.53, 97.74
Classmates *more* [a]	0.50	0.01, INF	Classmates *more* [a]	0.60	0.02,INF
Children with vision impairment *less* [b]	0.90	0.05, 14.85	Children with vision impairment *less* [b]	1.11	0.07, 22.01
Socio-economic status					
Classmates *more* [a]	6.55	0.61, INF	Classmates *more* [a]	3.00	0.08, INF
Classmates *less* [b]	4.68	0.27, 314.10	Classmates *less* [b]	3.06	0.03, 313.2
Children with vision impairment *more* [b]	1.44	0.05, 117.60	Children with vision impairment *less* [b]	0.70	0.01, 20.30

Note. OR = Odds ratio; CI = Confidence interval; INF = Infinity.
[a] Median unbiased point estimate used. [b] Conditional likelihood function point estimate used.
*, p<.05. **, p<.01, ***p, <.001.

Table V16. Step 2 and 3: Mann Whitney *U* Tests of academic performance of children with and without vision impairment two years later

Factor that passed Step 1	*n*				Mann-Whitney *U* value					
					Step 2	Step 3				
	Poor VI	*Good* VI	*Poor* CL	*Good* CL		Group compared to *good* classmates		Group compared to *poor* classmates		Differential?
						Poor VI	*Good* VI	*Poor* VI	*Good* VI	
Stakeholder factor										
Early intervention	8	4		19	15.5	36.0*	21.5			Yes
School attitude	6	3	12	7	2.5	16.5	1.0*	30.0	0.0**	Yes
Staff support	5	4	9	10	5.0	19.5	7.0	22.5	7.5	
Vision aides & equipment	7	1		21	1.0	31.0*	5.5			Yes

Note. VI = Children with vision impairment; CL = Classmates; *Poor* = Children in *poor* or *more* conditions at Time 1; *Good* = Children in *good* or *less* conditions at Time 2;
Step 2 = Within-groups (children with vision impairment) comparison; Step 3 = Between-groups (children with vision impairment versus classmates).
*, p<.05. **, p<.01, ***p, <.001.

Appendix W. Spearman correlation between stakeholder and child/teacher/principal demographic factors for children with vision impairment

Table W1. Spearman correlation between stakeholder and child/teacher/principal factors for children with vision impairment at Time 1

Stakeholder factor	Co-existing disability severity	Teacher Training and Experience						Teacher attitude	School attitude	Staff support	Individ
		Total	No. bachelor units	No. post graduate units	Annual PD (hours)	Experience with student disability	Experience with student VI				
Early intervention (months)	**.487*[a]**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total teaching experience (years)	.189 [a]	.241 [a]	**-.676**[a]**	.000 [a]	.069 [a]	.055 [a]	.055 [a]	-.079 [b]	-.101 [c]	.289 [c]	-.180 [a]
Physical environment	**-.489* [a]**	**.586** [a]**	.443 [a]	**.479* [a]**	.142 [a]	.444 [a]	**.478* [a]**	**-.505*[b]**	.384 [c]	.203 [c]	**.566**[d]**
Adult involvement											
Appropriate	-.284 [a]	.230 [a]	.378 [a]	-.063 [a]	-.049 [a]	.143 [a]	.153 [a]	-.089 [b]	.135[c]	-.400 [a]	.470 [d]
Minimal	.383 [d]	-.160 [a]	-.135 [a]	.157 [a]	-.326 [a]	.018 [a]	-.076 [a]	.217 [b]	-.071 [c]	-.222 [c]	**-.591** [d]**
Over	-.205 [d]	.208 [a]	-.630 [a]	.000 [a]	**.500* [a]**	.017 [a]	.263 [a]	-.468 [b]	.062 [c]	**.545* [c]**	.359 [d]
Vision aids & equipment	-.257[e]	-.069 [e]	.156 [e]	.155 [e]	.103 [e]	-.107 [e]	-.088 [e]	.267 [f]	-.167 [f]	**.578* [f]**	-.297 [e]
Teacher training & experience	-.157 [a]							-.443 [b]	.373 [c]	.092 [c]	**.572* [a]**
Teacher attitude	.054 [b]	-.443 [b]	-.017 [b]	-.222 [b]	-.430 [b]	-.420 [b]	-.419 [b]		-.119 [g]	-.0390[g]	-.403 [b]
School attitude	-.161 [c]	.373 [c]	.192 [c]	-.026 [c]	.067 [c]	.422 [c]	.043 [c]	-.119 [g]			
Staff support	-.274 [c]	.092 [c]	.115 [c]	.204 [c]	.170 [c]	.068 [c]	-.241[c]	-.039 [g]	.253 [c]		.069 [c]
Individualisation	-.099 [d]	**.572* [a]**	.373 [a]	.206 [a]	.393 [a]	.390 [a]	.331 [a]	-.403 [b]	**.541* [c]**	.069 [c]	

Note. VI = Vision impairment; PD = Professional development; Indiv = Individualisation.[a] *n* = 19. [b] *n* = 18. [c] *n* = 17. [d] *n* = 20. [e] *n* = 14. [f] *n* = 13. [g] *n* = 16.
*, p<.05. **, p<.01, ***p, <.001.

Table W2. Spearman correlation between stakeholder and child/teacher/principal factors for children with vision impairment at Time 2

Stakeholder factor	Co-existing disability severity	Teacher Training and Experience						Teacher attitude	School attitude	Staff support	Individ.
		Total	No. bachelor units	No. post graduate units	Annual PD (hours)	Experience with student disability	Experience with student VI				
Total teaching experience (years)	.278 [a]	.205 [a]	**-.633**[a]**	.047 [a]	-.007 [a]	.383 [a]	-.088 [a]	.020 [a]	-.406 [b]	.150 [b]	-.401 [a]
Physical environment	-.332 [c]	**.471* [a]**	.261 [a]	.453 [a]	**.530* [a]**	.285 [a]	.316 [d]	-.086 [c]	.079 [d]	.153 [d]	.369 [c]
Adult involvement											
Appropriate	.292 [c]	.185 [a]	.421 [a]	.299 [a]	.296 [a]	-.007 [a]	.186 [a]	-.274 [c]	.132 [d]	-.143 [d]	.375 [c]
Minimal	.270 [c]	-.399 [a]	-.311 [a]	.271 [a]	**-.472* [a]**	-.118 [a]	-.444 [a]	.074 [c]	-.294 [d]	-.091 [d]	-.348 [c]
Over	.000 [c]	.290 [a]	-.144 [a]	-.085 [a]	.338 [a]	.141 [a]	.413 [a]	.388 [c]	.206 [d]	.240 [d]	-.059 [c]
Vision aids & equipment	**-.505*** [b]	.187 [e]	-.013 [e]	0.000 [e]	.069 [e]	.100 [e]	.178 [e]	.437 [b]	.496 [f]	.405 [f]	-.440 [b]
Teacher training & experience	.250 [a]							.016 [a]	.229 [b]	-.211 [b]	.361 [a]
Teacher attitude	.277 [c]	-.032 [a]	.016 [a]	.126 [a]	-.161 [a]	-.032 [a]	.121 [a]		**.539***[d]	**.566*** [d]	.024 [c]
School attitude	.114 [d]	.229 [b]	.373 [b]	.230 [b]	.155 [b]	.020 [b]	.298 [b]	**.539*** [d]		.219 [d]	**.483* [d]**
Staff support	-.125 [d]	-.211 [b]	-.185 [b]	.205 [b]	-.159 [b]	-.231 [b]	.099 [b]	**.566*** [d]	.219 [d]		.015 [d]
Individualisation	-.064 [c]	.361 [a]	**.504* [a]**	**.474* [a]**	.379 [a]	.245 [a]	.198 [a]	.024 [c]	**.483* [d]**	.015 [d]	

Note. VI = Vision impairment; PD = Professional development; Indiv = Individualization.
[a] $n = 19$. [b] $n = 17$. [c] $n = 20$. [d] $n = 18$. [e] $n = 16$. [f] $n = 15$.
*, p<.05. **, p<.01, ***p, <.001.

Table W3. Spearman correlation between stakeholder and child/teacher/principal factors for children with vision impairment at Time 3

Stakeholder factor	Co-existing disability severity	Teacher Training and Experience						Teacher attitude	School attitude	Staff support	Individ.
		Total	No. bachelor units	No. post graduate units	Annual PD (hours)	Experience with student disability	Experience with student VI				
Total teaching experience (years)	.307	.019	**-.566***	.00	.005	.159	.061	-.270	.120	.396	-.42
Physical environment	.324	.182 [a]	**.674*** [a]	.532 [a]	-.092 [a]	.050 [a]	-.148 [a]	**-.629*** [a]	.206 [a]	**.676*** [a]	.310 [b]
Adult involvement											
Appropriate	-.481	.142 [a]	-.081 [a]	.374 [a]	-.045 [a]	.219 [a]	-.144 [a]	-.350 [a]	.336 [a]	.055 [a]	-.455 [b]
Minimal	.345	.229 [a]	.054 [a]	-.224 [a]	.382 [a]	.175 [a]	.291 [a]	.162 [a]	-.009 [a]	-.155 [a]	.537 [b]
Over	.439	-.437 [a]	.036 [a]	-.235 [a]	-.248 [a]	-.551 [a]	-.121 [a]	.589 [a]	**-.664*** [a]	.086 [a]	.316 [b]
Vision aids & equipment	.320 [c]	-.145 [c]	-.690 [c]	-.167 [c]	.237 [c]	.050 [c]	-.174 [c]	-.128 [c]	-.084 [c]	.000 [c]	-.694 [b]
Teacher training & experience	-.157							-.171	.154	.120 [a]	.137 [b]
Teacher attitude	-.199	-.402	-.171	-.527	-.204	-.322	-.112		-.565	**-.629***	.094 [a]
School attitude	-.075	.478	.154	.196	-.135	.541	.277	-.565		.190	.235 [b]
Staff support	.121	.120 [a]	.206	.389	-.162	-.029	.046	**-.629***	.190		.235 [b]
Individualisation	.583 [b]	.137 [b]	.436 [b]	-.204 [b]	.168 [b]	.537 [b]	-.064 [b]	.094 [a]	.235 [b]	.235 [b]	

Note. Unless specified, n = 12. VI = Vision impairment; PD = Professional development; Indiv = Individualisation.
[a] n = 11. [b] n = 10. [c] n = 8.
*, p<.05. **, p<.01, ***p, <.001.