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Te Tāhuhu o te Mātauranga

Scoping support for New Zealand Sign Language users accessing the Curriculum

Part I: An international literature review

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Language instruction to children with hearing loss requires the highest level of competency at the earliest age levels in order to optimize neural plasticity providing the child the best opportunity to develop age or cognitively appropriate language development. This document addresses the need for children with hearing loss and their families to have high quality opportunities in visual communication, as we would also strive to provide for auditory/spoken language communication.

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Literature Review

1. Introduction

The under-achievement of students who are deaf, with particularly poor English skills, has been an enigma to professionals and parents for decades (Colorado DOE, 2002).

Deaf school leavers have been reported to have an average reading age of 9 – 12 (Gregory 1996, Komesaroff 1999, Paterson 1994, Mahshie 1995, Yoshinaga 1997). Later research also reports significant delays (Grimes et al 2007, Hendar 2009, Geers et al). Deaf and hearing-impaired children perform better in mathematics than reading but still lag behind their hearing peers (Davies,1991). Paterson also cites American research which showed that only one third of hearing-impaired students received high school diplomas compared to 75% of African American students. More than 30% leave school functionally illiterate.

And yet deaf people have IQs close to the mean for hearing people. Braden (1992) notes that the ability to speak has been considered synonymous with intelligence and criticises early studies of the intelligence of deaf people because of the poor testing measures.

Low achievement, particularly for severely and profoundly deaf children, has also prevailed despite the fact that a good education and competence in the majority language are essential for a good economic and social future.

This low achievement has led to a growing interest in the idea of educating deaf children bilingually, acknowledging the value of both sign and the spoken language in the classroom.

Disadvantage in education is now widely believed to begin with the linguistic delay experienced by many deaf children and is compounded by schooling conducted often in an inaccessible mode. Without access to a spoken mother tongue, access to Sign Language becomes critical (Reffell and McKee, 2009).

The superior achievement in many domains of deaf children of deaf parents supports the conclusion that higher-level cognitive processes are not speech input dependent but *information* input dependent (Wilbur, 2001).

For most deaf children, their early language models are not fluent users of the language they are learning. The signing from Deaf peers and adults may also be quite variable. This restricted language input often results in language delays that make it more difficult to take advantage of fluent language when they encounter it (Schick et al, 2006).

The most significant difference between a deaf and hearing perspective of deaf education is the choice of language for instruction. It is only in bilingual programmes that Deaf people and their language are central to the education of the deaf (Komesaroff, 1999).

One hundred and forty-one Deaf community, professionals and families have recently responded to a recent Human Rights Commission survey to confirm their top three priorities for NZSL include enhancing deaf children's early access to education through New Zealand Sign Language(NZSL), support for families to learn NZSL and making interpreter services more available and of better quality (Human Rights Commission Survey, 2010).

Legislation and policy are also supportive, although not insistent on the use of NZSL:

- The Education Act 1989 requires schools to accept all students regardless of need and the Special Education Policy Guidelines requires consideration of learners' language and culture in planning programmes. The 2007 NZ Ministry of Education's Curriculum Statement (p 14) notes that NZSL may be the medium of instruction across all learning areas. The Ministry of Education and the two Deaf Education Centres recognise NZ Sign Language as one of the languages in a Deaf bilingual environment.

- The New Zealand Sign Language Act 2006 recognises New Zealand Sign Language as an official language of New Zealand, alongside English and Māori and states *that government services and information should be made accessible to the deaf community through the use of appropriate means (including the use of New Zealand Sign Language).*

- The Human Rights Act (1993) expects services to be accessible to all people except where it is not reasonable to expect this.

- The Health and Disability Commissioner Act 1994 states that the duties of disability services providers should be able to communicate effectively with their consumers, including through the provision of interpreters.

- The 2001 New Zealand Disability Strategy, impacting on all government departments, notes their third objective to provide the best education for disabled people and specifies the need to provide access to education in NZSL as well as the use of other communication technologies.

- The UN Convention on the Rights of Persons with Disabilities (2007) requires signatories, including New Zealand, to ensure that deaf people have access to government information and services, to allow the use of New Zealand Sign Language, and to ensure the provision of Sign Language interpreters. It notes in article 24 its support for inclusion in education but also specifies the need to facilitate the learning of Sign Language and the promotion of the linguistic identity of the deaf community.

We do know that no single method of communication will be appropriate for all deaf children. They will have many different routes to the same goal, through Sign Language, oral and auditory modes, as well as manually coded English or a combination of these. The goal must be to identify the hearing loss as early as possible and match the strengths and needs of each child and their family (Marschark & Spencer, 2003).

This literature review has focused on the needs of those deaf children for whom visual communication through a Sign Language is beneficial for their educational development. The aim is to allow the sector to constantly and critically re-examine its work and approaches, as is called for in the literature (Schick et al 2006).

One of Australia's researchers has analysed trends, including school enrolment, neonatal screening, and census data, and has concluded that the incidence of severe and profound childhood deafness is less than traditionally assumed (0.1%) and that the signing Deaf community is slowly shrinking at both older and younger ends. Contributors to this decline include improved medical care such as vaccines, as well as cochlear implantation, improved hearing aids and developing genetic screening and gene therapy (Moores, 2004).

2. Oralism

Oralism has been the dominant educational philosophy for deaf children from the late 1800s.

We know that the window of language learning is most responsive in the first few years of life and language will be delayed if family support is not evident. Language should not be learned at school (Easterbrooks and Baker, 2002). It is in the context of the family that language develops naturally for all people. The family environment influences cognition, communication, parent-child attachment, socio-emotional health and literacy (Easterbrooks and Baker, 2002). Yet most families are fluent in spoken language and want their children to hear.

US research identified five key variables for successful language development, of which the most important is the sheer amount and diversity of language experienced by the age of three that has a lifelong impact on the child (Hart & Risley, 1995).

The current Alexander Graham (AG) Bell Academy reflects the fundamental divide in their website when they state that when properly aided, children with hearing loss can detect most, if not all, the speech spectrum. There is a clear expectation of clinicians that they should expect the most profoundly hearing-impaired children to hear speech and learn to talk if aided correctly. Certainly, there have been significant gains in both hardware and teaching technologies.

However, in oral programmes, others are not.

Signing often becomes a second choice for parents and is only sought when the child has failed to develop language and this is considered to be too late for them to develop age-appropriate Sign Language (Paterson, 2004).

Signing often becomes a second choice for parents and is only sought when the child has failed to develop language.

The Colorado programme confirms what many other leading researchers are saying. Both sides of the debate are right, but it is not a question of an either/or approach but rather an all-inclusive one.

There is insufficient data to determine whether either or both approaches are definitively effective for children with little outcome data available and many variables that can affect it. There are small studies and much anecdotal evidence that both approaches support the education of students and have strengths and limitations for individual students. There is some core agreement that a range of language approaches is needed, depending on the needs of the student (Grimes etc al, 2007).

The Colorado CHIP programme acknowledges the harm caused by promoting one method over another with no evidence to support the claim and also by the need to fail in one method to have access to another (Yoshinaga, 2010). Diversity must be accommodated in a variety of methods.

A no-exclusion service avoids any narrow language approach and takes into account the wide diversity of strengths and weaknesses of individual learners. Prolonged multilingual development would be viewed as an enrichment rather than as a disadvantage. Taking a monolingual approach would be the outcome of a well-informed choice from a menu of options (Grimes et al, 2007).

The diversity of deaf children's language needs means that the teacher must identify the most efficient pathway for each child depending on which language the child most easily uses. Careful assessment and monitoring of language performance and development is critical to language planning processes (Easterbrooks and Baker, 2002).

3. The Need for Early Language

Advances in research about deaf infants, Sign Language linguistics, bilingualism and language learning have developed a new framework for understanding the causes of traditional problems in educating deaf children (Mahshie, 1995).

The literature is limited but unequivocal. It does not matter what language a deaf child learns but the importance of early access to a communication mode that best suits their needs is critical for language development (Leigh, 2008).

Nevertheless, our understanding of Sign Language linguistics and acquisition and use of Sign Language structures is still in its infancy (Schick et al, 2006). We know that some deaf students are excellent readers and writers but we do not know how many there are, nor how they achieved it. Many have lamented the lack of research available on semantic and syntactic development after the preschool years even though this is particularly important for deaf children because of the diverse and variable language models they experience (Schick et al 2006, Gregory 1996, Easterbrooks & Baker 2002).

Bilingual Threshold Theory postulates that recognition of and instruction in the child's first language appears to facilitate the development of the second language and consequently overall educational achievement.

Nevertheless, Cummins' (1984) theoretical framework (Bilingual Threshold Theory) has proved useful to Sign

Language advocates and users. It postulates that two separate language systems are linked to a common conceptual core (Evans, 2004). Recognition of and instruction in the child's first language appears to facilitate the development of the second language and consequently overall educational achievement.

Cummins' theory implies that experience with either language can promote the proficiency of both languages. This common proficiency lies at the deeper conceptual level, rather than at the surface level (pronunciation, grammar, vocabulary). It enables the transfer of skills including conceptual knowledge, higher-order thinking skills, reading strategies and writing composition skills (Evans, 2004).

It was first noticed that deaf children of deaf parents were more linguistically advanced than severely/profoundly deaf children of hearing parents. It is now well accepted that strong early development in a first language is necessary for long-term linguistic development in the same language and/or the later learning of a second language (Johnston et al, 2002).

There may even be an advantage for deaf children, as learning Sign Language acquisition is possible before other children can acquire speech (Schick et al, 2006).

It is now well accepted that strong and normal early development in a first language is necessary for long-term linguistic development in the same language and/or the later learning of a second language.

Strong and Prinz (1997) assessed the Sign Language and English literacy skills of 160 students in the US and found that children with higher levels of Sign Language outperformed children in the lowest levels of Sign Language in English literacy regardless of age and IQ. Their conclusion was that Deaf children's learning of English appears to benefit from early fluency in Sign Language. Hermans et al (2008) found a high correlation between scores in a sign vocabulary and reading vocabulary. Mahshie (1995) reports small studies showing children in Sweden who started learning Sign Language early (before two years old) performing as well as their hearing peers in standardised reading achievement tests.

Recognition that signed and spoken languages may not be strictly comparable, however, allows us to see the uniqueness of a visual language and understand that development of deaf children may be different too from their hearing peers (Schick et al, 2006).

Early intervention is particularly important for making learning opportunities available (Marschark & Spencer, 2003). With early screening of hearing loss in infants and guidance from parents to provide their deaf children with signed input from their early months, it is thought that significant language delay in most cases could be a thing of the past (Schick et al, 2006).

Comprehensive early intervention programmes should embrace a family-centred service with a developmental perspective. They provide support to children and their families through an interdisciplinary community-based approach (e.g. audiologists, social worker, speech therapist and deaf consultants). These collaborative programmes should use developmentally appropriate

practice, be assessment based, culturally responsive and community based (Marschark & Spencer, 2003).

3.1 Colorado Home Intervention Program

One often-cited programme is the Colorado Home Intervention Program (CHIP), which offers home-based services for Colorado families through the Department of Education.

CHIP works with families of children identified with significant hearing loss, including children with cochlear implants. It is a comprehensive service and is based on evidence that early identification and intervention result in significantly better language, speech and social-emotional relationships.

Having a single point of entry to services through a skilled professional for all deaf children is considered critical to managing the impartial and systematic approaches.

The early intervention providers are trained professionals, including early interventionists who are usually contracted consultants (audiologist, physical therapist, oral communication consultant, social worker, parent consultant, and deaf or hard-of-hearing consultant), who have typically received post-graduate training and are trained as they enter the service.

They receive ongoing high quality in-service training in counselling, developmental assessment, auditory skill and speech development, Sign Language development, language and cognitive and social-emotional development. There are also a variety of positions such as early-intervention providers, Sign Language instructors and mentors for families who want ongoing communication with adults who are similar to their own children.

Funding comes from a variety of sources: health insurance, user pays as well as state education.

As with Scandinavian practice, parents consider their choice of communication modality and to use whatever combination is most appropriate (Vestberg, 1990).

Regional co-ordinators contact families very soon after notification to offer support to families. It is considered vital that there is a single point of entry to the service that ensures a balanced and supported approach for parents. They do not remain as the long-term interventionist, and focus on helping the family make the best decision for them. Extensive emphasis is placed on teaching them counselling strategies, such as theories of family systems, maternal bonding theories, social-emotional development and grief resolution strategies as well as auditory skills development. They contract in suitable providers and provide training and professional support.

Information (e.g. resources, strategies, development, methods of communication) is provided to the parents through 1 – 1.5 hour weekly sessions. Direct teaching services are not provided to the child.

A parent organisation, Colorado Hands and Voices, allows a strong independent parent voice and networking.

Developmental progress is monitored through six-monthly assessments that consist of parent questionnaires about child development and video-taped parent/child interaction.

Assessment data has been collected from the 1980s. It demonstrates:

- Language development within the normal range in the first five years of life. A significantly higher number of children have developed and maintained age-appropriate language skills, both orally and in Sign Language under this programme
- Significantly better vocabulary development
- Significantly better speech intelligibility
- Significantly better social and emotional development
- Their families were more likely to resolve grief and develop future strategies for their child earlier.

This programme has had success respected by all parts of the deaf education continuum, but results often become more variable as the children enter schools, which have the autonomy to make choices on how to support deaf children (see section 13).

4. Social Needs

The strongest examples of good practice in deaf education combine attention to the individual's deaf identity and social-emotional needs as well as proactive support and assessment for the development of speaking and listening skills (Swanwick & Tsverik, 2007).

No differences in social skills have been found in the various placement options. Deaf children tend to be more comfortable with other deaf children than with hearing, regardless of placement. Mainstream deaf children tended to be more socially mature than those in resource rooms or self-contained classrooms but it is unclear whether this was the reason for the placement in the first place. Mainstreamed deaf children were also considered less popular and more lonely than in other placement options (Marschark & Spencer, 2003).

Similarly, the very small pieces of research that focus on psychological and social outcomes of cochlear implantation report no evidence of negative psychological consequences. Better assessments are needed though to provide information about a child's sense of identity and self-esteem (Swanwick & Tsverik, 2007).

Despite these results, there is a plethora of literature about the poor mental health and self-esteem of Deaf people.

Several studies of mother-child communication, involving deaf children with hearing mothers, have suggested that poor maternal communication skills have negative impact on the children's

language learning. Conversely, several studies where the mother was deaf show that early interactions coupled with effective communications had positive outcomes on the child's language and also social-emotional development. The quality of the mother-child relationship was found to be strongly related to children's communication competence and also in other domains (Schick et al, 2006).

A random survey of a small sample of deaf students in New Zealand in 2000 concluded that half had significant social and personal development needs, including social isolation, anti-social behaviour or low self-esteem (Fitzgerald, 2000).

Schlesinger (2000) re-submits a convincing developmental model that explains the depressed achievement of deaf people that includes:

- difficulty in communication with parents;
- mothers' prolonged grief at having a deaf child;
- resentment at having to conform to the hearing world;
- delays in developing autonomy with protective parents (resulting in hostility in the child and failure to see current behaviour in terms of longer-term effects rather than immediate external control);
- lack of positive reinforcement for identity; and
- subsequent delays in development of self-esteem.

Deaf people who are only oral at home, but need visual communication, often have lower self-esteem due to feelings of isolation and exclusion. Deaf children of Deaf parents consistently demonstrate the strongest deaf identity and highest self-esteem (Nealy, 2007).

Bridgman's research on Deaf mental health needs in 2000 also notes that the New Zealand Deaf community has a high risk of mental illness and a high need for mental health services (Bridgman, 2000). A random selection of Deaf Aotearoa clients were interviewed by Deaf people using a standardised mental health assessment. Bridgman found that:

- Nearly 10% of the Deaf population were positioned at the chronic and severe end of the mental illness spectrum (as compared to 3% in the mainstream population).
- 20% were using a mental health service or professional. This was half of those who stated that they wanted some form of counselling and/or medication (44%) and also half the proportion using mental health professionals in the Netherlands where there are comprehensive mental health services.
- The prevalence of mental distress for Deaf children is believed to be 1.5 times higher than for hearing children. Tuohy (2007) also notes that rates of Deaf requiring mental health services are nearly double that of the hearing population.

- Social support, counselling and employment services are needed by around 40% of the population.

Tuohy (2007) also notes the correlation between positive Deaf identity and positive mental health. Where there is impoverished communication, isolation, negative attitudes and medicalisation of deafness, Deaf people struggle to achieve a positive identity.

5. Teaching in NZSL

Teaching curriculum in a sign language is often generically referred to as bilingual education. Bilingual education involves teaching academic content in two languages, in a first and secondary language with varying amounts of each language used in accordance with the program model. Bilingual programmes require proficiency in a first language and for some deaf children Sign Language is the most accessible form of language.

Provision of early Sign Language generally requires a shift from a deficit perspective on deafness towards a cultural perspective (Evans, 2004; Johnston et al, 2002). As human beings, we generally feel more comfortable with people like ourselves so deafness is often seen from a deficit perspective, requiring an audiological fix or cure. A cultural perspective of deafness instead has a greater acceptance of difference in culture and language. Sign Language is seen from this perspective as an integral part of the educational and personal development process rather than just a means to an end of learning English (Swanwick, 2002).

The purpose of bilingual programmes is to enable deaf children to become linguistically competent, access an age-appropriate curriculum, facilitate literacy skills, provide opportunity for meaningful social interaction and dialogue, and provide deaf students with positive sense of themselves and their own identity (Pribanić, 2006). Bilingualism implies a focus on developing competence in two languages.

Minimal requirements of a bilingual programme include the involvement of native users of the Sign Language, delivery of at least some of the curriculum in that language and explicit approaches to using Sign Language to teach reading and writing skills. The Sign Language curriculum and material to access the curriculum are also thought vital (Gregory, 1996).

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There are no general claims for the overall benefits of bilingual education for any child who presents at school without age-appropriate acquisition of the first language. Because the vast majority of deaf children are born into hearing families who do not know Sign Language, sign bilingualism strives to create the conditions in which deaf children do present at school with, or develop soon after, a well-developed language (Johnston et al, 2002).

The research of Mayer and Leigh (2010) suggests that few deaf children acquire sign language adequately for effective learning and that this is a fundamental problem for bilingual programmes. A delay in the first language (sign) will almost automatically mean that the acquisition of the second language (English) is compromised.

There is some evidence, however, of the positive impact of bilingual programmes:

Ahlgren, the leader of the early bilingual project in Sweden, showed that normal language development could occur in deaf children with hearing parents by the age of four (Davies, 1991).

The subjects from the eighties were superior to their deaf age-mates from twenty years earlier in all tests measuring ability to understand and use written Swedish. They also performed significantly better on tests of mathematical and numerical ability.
(Heiling (1990) in Mahshie, 1995).

Early in the transition to bilingualism, a researcher noted that 55% of deaf children were reading for meaning as opposed to 10 – 15% before the programme started (Mahshie, 1995).

Nearly all the successful readers in one study of 15-year-old Deaf children were from bilingual classes. Half of the children educated traditionally (orally) fell into the least-successful reading comprehension group (Mahshie, 1995).

Conversational development is a priority in which children learn to ask and answer questions and engage in conversation (Easterbrook & Baker, 2002). Theory of Mind reasoning involves the ability to understand mental states – the belief, desires and intentions of others – and to appreciate how these differ from our own. Meristo et al (2007) concluded that this may be strengthened through early and ongoing access to Sign Language. They showed that children receiving bilingual or bimodal instruction together with Sign Supported and spoken Italian significantly outperformed children in oralist schools in Theory of Mind tasks, in which communication was in Italian with a heavy reliance on lip-reading.

There is certainly wide agreement among many researchers that early exposure to Sign Language allows children to communicate more effectively, but there are disagreements on how to guide deaf children to reading and writing English (Evans, 2004). Sign bilingual programmes differ from other bilingual programmes in three significant ways:

a) Language modality (signed vs. spoken or written). This does not pose a significant barrier because Sign Language operates in the same ways as spoken language.

b) The absence of a written form of language. Deaf difficulties with written language can be traced to the dependence on prior knowledge of speech and language when teaching reading. Additional translation steps are required of the Deaf learner to shift to a static written language and understand the different conventions and characteristics of each modality. The exact nature of these steps and how to facilitate their development have yet to be defined.

c) The inconsistent exposure of deaf children to a strong first language.

Evans (2004) also notes that implementing teaching practices based on Cummins' theory with deaf students is a complex and confusing process. Her analysis of bilingual elementary schools concluded that using Sign Language as the language of instruction and making translation conceptual rather than literal contribute to literacy learning (Evans, 2004).

Particular challenges for deaf children include:

- Encoding elements of Sign Language that are represented in the *manner* of signing rather than the sign itself (e.g. an expression).
- Representing a sentence in English word order, which is different to that in Sign Language.
- Capturing non-manual signals in printed form that convey important semantic and syntactic information.

Without direct instruction, the grammar of Deaf students can be resistant to change even when they write with purpose, and syntactic development often will only occur over years and in programmes where students are encouraged to write frequently and at length. Oral and signing children often make the same syntactic mistakes. Bridging the modalities of the two languages is still not fully understood and the role of inner language is also still unclear (Marschark & Spencer, 2003).

Key principles of bilingualism are (Johnston et al, 2002):

- Language of instruction is the natural Sign Language of the deaf community.
- The programme seeks to develop English primarily through reading and writing but also spoken English where appropriate. English is learned as a second language.
- The rules of English are explained through Sign Language.
- Sign Language and English are presented as two distinct and separate languages.
- Sign Language and English are compared and contrasted and the differences between the two languages are explored in order to help students develop metalinguistic skills.
- The acquisition of Sign Language is encouraged as early as possible, accompanied by an understanding of deaf culture, in order to develop self-esteem.

- Deaf adults, peers and significant others are the preferred role models for language acquisition, the development of a social identity and enhancement of self-esteem.
- The culture of both communities is presented as valued and equal.
- Parents and the deaf community are given opportunities for involvement in the various aspects of the programme.
- Speech skills are developed through a variety of approaches designed specifically for the cultural background and hearing loss of the student.
- Children of deaf adults and siblings of deaf children have a place in the programme as additional members of the bilingual/bicultural community.

In all successful bilingual programmes, parents are involved in developing their own ability in Sign Language so their children can acquire it more easily (Paterson & Konza, 1997).

Class sizes in the US are generally small (five to six students) and this promotes teacher-directed instruction and can allow little interaction among peers. Resistance to larger class sizes is due to the varying competencies in Sign Language among students and possibly teachers as well. Combining two classes is possible if two teachers (one Deaf and one hearing) are retained to work together (Evans, 2004).

While sign bilingualism was heralded as the remarkable breakthrough in deaf education, it is now evident that this is not a simple matter. Future programmes need clear and specific descriptions of student background variables, such as previous education, family signing skills and other individual differences.

Moores (2004) notes that bilingual programmes have plateaued and have not spread to public schools except for a few charter schools. Johnston et al (2002) note that many bilingual programmes are bilingual in name only and do not meet requirements. For example, one study showed that 44% of 18 programmes rated their instructional staff as less-than-fluent Sign Language users. They argue that it is essential that outcomes should only be looked for from bona fide programmes. They have provided a list of best practices in choice of language and communication, curriculum and assessment, staffing, and parents and community (Johnston et al, 2002).

Grimes et al (2007) also found that the extent and quality of Sign Language and English provision varied according to local factors and capacity rather than linguistic requirements of the student.

Bilingual approaches consisted of only 4% of England's 2003 survey but the authors also noted an increasing preference for a Total Communication approach which was child centred , placed an equal value on Sign Language and therefore veered towards a more explicitly bilingual education. It was mooted that this could accommodate all individual approaches along the monolingual continuum as well as encompassing the bilingual option. They also found that some Total

Communication approaches included the use of Sign Language and but concentrated on the use of sign support alongside spoken English.

Evans (2004) advocates for the future development of bilingualism in finding the most effective balance between explicit and naturalistic teaching methods; examining the process of teaching translation skills to determine how print can link directly to internal concepts, studying the practice of Deaf and hearing teachers working in teams with larger classes; determining the role and place of teachers of Deaf studies curricula and Deaf culture in general, and moving from a deficit to a cultural model in Deaf education (Evans, 2004).

Munoz-Baell et al's research (2007) of 41 Deaf education experts in 18 countries showed that key promoting forces for bilingual programmes were a growing social and political acceptance of diversity, growing Deaf self-awareness and activism, scientific research on sign linguistics and bilingualism, acceptance of the problems with oral education, and international cooperation. Hindering forces include: medical models of deafness that focus on a technological solution, society's focus on sound and speech and fear of the unknown, deaf educational policies such as mainstreaming and resistance to modern teaching methods, bilingual education weaknesses, such as the lack of skilled teaching staff, and the invisibility, heterogeneity, small number and under-performance of the deaf population.

6. Children with Cochlear Implants

Developments in newborn hearing screening and cochlear implants together with a focus on inclusive education have served to dramatically alter expectations about educational outcomes for deaf children (Leigh, 2008).

Deaf children have more auditory access than ever before, but there will remain some children for whom exclusively auditory-oral approaches fail and the only viable access to social, cognitive and language development will be through Sign Language.

Deaf children have more auditory access than ever before, but there will remain some children for whom exclusively auditory-oral approaches fail and the only viable access to social, cognitive and language development will be through Sign Language.

Reasons for the diversity in the outcomes for implants include age of implantation and length of experience with the implant, type of rehabilitation received, physiology of the auditory system, presence of associated disabilities, nature of the educational setting and communication mode employed by the child (Leigh, 2008).

Most children with implants improve their speech and language skills regardless of the type of language programme they are in and most children in oral or auditory programmes remain delayed in language skills after implantation relative to hearing children (Marschark & Spencer, 2003).

Signed communication is often not used in auditory-oral programmes although some signing may be introduced for those children with "poor outcomes". This is often much later than the sensitive period for language acquisition (Leigh, 2008). Some believe that many children with cochlear implants generally benefit from both Sign Language and spoken language as long as sufficient language exposure is provided (Swanwick & Gregory 2008, Swanwick & Tsverik, 2007, Marschark & Spencer 2003).

Some believe that many children with cochlear implants generally benefit from both Sign Language and spoken language as long as sufficient language exposure is provided.

Yoshinaga (2010) has found most recently that children who are educated through oral-aural combined with Sign Language instruction can achieve age-appropriate language levels on expressive vocabulary and receptive syntax from ages four through seven years.

Some Dutch research showed that parents using Sign Language used more varied grammatical structures, wider choice of lexical terms and provided better modelling of language use (Pribanić, 2006).

Sign Language is no longer be regarded as a threat to normal development of deaf children, but rather the best possible guarantee for normal development (Mahshie, 1995).

While we are learning about their effects on social and emotional development, we still know little if anything about their effects on academic achievement, peer interaction, and cognitive development. Most significantly...research concerning Sign Language development and its use in deaf children with cochlear implants is just now making some progress after a period of fervent – if unsupported – claims that Sign Language and implants do not mix.

While research on the development of Sign Languages is developing at an impressive pace, it appears that it is slowing in those countries that are most quickly embracing cochlear implants. Big Mistake. We never have been good at educating hard of hearing children – and most deaf children with implants are functionally hard of hearing even when their implants are functioning perfectly – and issues of how language is intertwined with literacy, academic achievement, and social-emotional functioning are still largely unresolved. (Schick et al 2006, p vi)

Three consistent findings were found in one study and have been confirmed in many others (Schlesinger & Meadow, 1972 in Schick et al 2006, Wilbur 2001, Swanwick & Tsverik, 2007):

- Children's use of sign does not interfere with spoken language development. In fact, spoken language increases as more sign is learned.

Children's use of sign does not interfere with spoken language development. In fact, spoken language increases as more sign is learned.

- Language milestones parallel those of hearing children, suggesting underlying development in all languages regardless of modality.

- The availability of Sign Language in families with deaf children greatly reduced frustration between children and parents.

Even though it is clear that no single method of communication is going to be appropriate for all children, Leigh (2008) postulates whether in fact all early identified or implanted deaf children should access Sign Language in order to ensure that no children are left without any effective language.

Alternatively, children should be identified as early as possible who *might* need access to Sign Language and provide these children with both languages. While we are still unable to predict which children will be able to acquire spoken language competence (Marschark & Spencer, 2003), the specialised electrophysiologic assessment techniques, for example, can identify specific neuropathies which may predict those children that will have difficulty accessing spoken language communication. Children with an auditory neuropathy or brainstem auditory neuropathy are unlikely to have positive outcomes with an oral only programme. A range of other factors including family, home language and preferences also need to be taken into account. This is highly contentious because many auditory educational environments are sign-free (Leigh, 2008).

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Moog and Geers (2003) reported on the analysis of the achievement of 181 children with cochlear implants in educationally diverse settings, including public and private schools, mainstream and special education and oral, total communication and signing environments. Unlike many of the other studies cited in this review, children from oral programmes in this research achieved a higher expressive language, speech perception, speech production, oral language and total language scores than from children in signing programmes. There were no differences in their language comprehension or verbal reasoning abilities. Moog and Geers (2003) argue that this is the most compelling support for oral environments in the literature.

Geers et al (2008) also found that early cochlear implantation had a long-term positive impact on auditory and verbal development, but did not result in age-appropriate reading levels in high school for the majority of students.

The practice of bilingual education must enable cultural and linguistic values to coexist with appropriate

The practice of bilingual education must enable cultural and linguistic values to coexist with appropriate oral/aural exposure and support. Auditory/oral approaches, including the use and maintenance of amplification aids such as hearing aids and cochlear implants, can be used in conjunction with other approaches, including bilingualism.

oral/aural exposure and support. Auditory/oral approaches, including the use and maintenance of amplification aids such as hearing aids and cochlear implants, can be used in conjunction with other approaches, including bilingualism (Swanwick & Tsverik, 2007).

This has been seen as a sensible approach for some time. In the late 1800s, Gallaudet adopted his "Combined Approach" with the addition of speech lessons to Sign Language instruction in an effort to take a central position in the debate.

7. Sign Supported English

Signed English has been used for many signing students. Many teachers have been traditionally unwilling to sign without speaking and the result was a kind of code-mixing which produced neither language properly (Pribanić, 2006, Johnston et al, 2002).

In a bilingual class, there is considerable agreement among bilingual advocates that that Sign Supported English should be only used for a particular reason, for example to support reading, rather than as a language of instruction. (Swanwick & Tsverik, 2007).

There is widespread support among some practitioners for the use of Signed English to assist with the learning of English. Mayer and Leigh (2010) argue that with early identification, more effective amplification, the vast majority of profoundly deaf children will learn spoken language and that the value of using simultaneous speech and sign may be reconsidered. Children may therefore learn sign language as the second language.

The Colorado CHIP program advocates teaching all parents and educators in Sign Language but notes that code-switching to Sign Supported English commonly occurs with children who are responsive to spoken English instruction.

7.1 Other Culture

Ethnicity is a key indicator for not achieving well in any deaf education modality.

Smiler (2006) describes the feelings expressed by Māori research participants of being "on the fringes", which they attributed to minimal cross-cultural and linguistic understanding among Māori and Deaf of each other. Māori Deaf people sit on the boundaries of both these worlds and are likely to be more disadvantaged in gaining full access to their communities. In Māori settings, they have limited access to language, and in deaf settings, have little opportunity to express themselves as Māori.

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Māori tended to employ traditional kinaesthetic ways of learning by observing and listening and then doing, so many Māori Deaf are able to "do Māori things" but for more meaningful

communication, turned to the Deaf community. Smiler notes that many Māori Deaf are becoming increasingly aware of their dual identity.

The 2006 DEANZ Gap Analysis confirmed the lack of cultural consideration for Māori and Pacific families was one of the top five gaps in deaf education.

8. Professional Development

Barriers to bilingualism include the lack of high-quality, consistent and affordable Sign Language training (Leigh, 2008). Many teachers learn sign from the children they teach (Schick et al, 2006).

Barriers to bilingualism include the lack of high-quality, consistent and affordable Sign Language training.

Reeves et al (2000) note that the need that is consistently ranked highest by students, teachers and administrators is the ability to sign. They consider this the most important characteristic of an effective teacher and support staff for visually communicating children. They note an early study which showed that only six out of 140 teachers who said they were using American Sign Language were actually doing so. The most important components of Sign Language were sign production; appropriate pace and pausing; message equivalency; grammar, with emphasis on effective use of space for referents; use of body language and facial expressions to express feelings and as grammatical structures. A detailed Sign Language assessment and process is provided.

A 1998 Australian survey of nearly 100 teachers of the deaf showed only 23 teachers who were deaf or hearing impaired and only eight were fluent in Auslan (Komesaroff, 2001).The Australian experience supports the contention that professional development is the key to bilingual success. Hearing staff must be able to communicate with deaf pupils by developing and maintaining language skills. Inadequate levels of signing, limited opportunities for in-service training and a lack of requirement in proficiency for employment or registration provide major barriers to successful programmes. The barriers are both personal (reluctance to change) and structural (seeing deafness as a disability) (Komesaroff, 2001).

One solution, suggested by an Australian education official, is to is to target and retrain high school teachers, with specific knowledge of curriculum, in deaf education and Sign Language (Paterson, 2004).

Clearly, specialist instruction is also required. Given the layering and spatial organisation of meanings within signing, one could expect differences in development in signed and spoken modalities that will affect both social and cognitive development (Schick et al, 2006). Gregory also questions whether deaf children think differently because of their visual focus (Gregory, 1996), influencing the method of instruction.

Parents are essential participants and the school needs to provide a bridge between deaf and hearing communities (Swanwick & Gregory, 2008).

8.1 The Role of Deaf Support Staff

McKee (2005) argues that the use of Deaf paraprofessionals in mainstream schools is a key success factor for visually communicating children because of their ability to model good language and cultural skills. The staffing structure should also reflect the bilingual community of the school. Deaf staff should be evident in the management team and teaching staff. The central role of deaf staff, valuing of deaf language and culture should be recognised.

Smith (2003) described an assessment by a group of Deaf teachers of the impact of having Deaf language assistants and other deaf workers as well as deaf community visitors in the classroom. They thought that these people offered strong models of Deaf culture, pride and identity and that their communication was clear, direct and comprehensive, giving deaf students total access to the curriculum. They were positive role models of deaf achievement and had high expectations for their students.

The lack of bilingual teacher training and dispersed population make contact with Deaf adults difficult. 70% of deaf students got to see a Deaf peer at most once a term and 78% saw Deaf adults once a term or less. As in Māori programmes, community para-educators have had a strong role in language development and decreasing dissonance between community and school. The Māori concept of 'kaupapa whānau' (groupings based on affinity and common purpose rather than biological ties) offers a model for understanding the bonds of the Deaf community and the need to have cultural group contact (McKee, 2005).

Colorado seeks to guarantee that each family has meaningful interaction with adults with hearing loss as EI providers, care coordinators, Sign Language instructors, trainers, counsellors or mental health workers, physicians, audiologists or administrators woven into the system.

Current roles of Deaf paraprofessionals include teaching Sign Language, providing a social role model, teaching Deaf Studies, supporting academic tasks as teacher aide or consultant, advising and educating parents, attending Keep in Touch Days, and supporting deaf preschool groups. They provide scaffolding for linguistic skill and social identity for deaf students, and cultural and linguistic resources for hearing professionals. There is potential to further professionalise these individuals and positions and provide better support for students, particularly in the mainstream (McKee, 2005).

By 2002, there had been a rapid increase in the number of Deaf personnel in Deaf education (Smith, 2003). Kelston had 21 Deaf staff by 1999. Most were in paraprofessional positions working with secondary-aged students. There were four people working in early childhood and none of these was a teacher or Adviser. There was a high concentration in the residential area but low representation in teaching and fewer in mainstream schools than in Deaf Education Centre classrooms. There were three deaf managers but none who supervised classroom teaching practices. Their job descriptions were criticised being often generic and not acknowledging their

specialist abilities to provide bridging instruction between Sign Language and English and develop metalinguistic awareness.

9. Educational Practice

Bilingual education raises complex issues of educational practice, staff training and administration. (Gregory, 1996). Significant amount of research is still underway to identify best teaching methods, assessments used and how best to support the language development, including speaking and listening as well as social-emotional needs (Swanwick & Gregory, 2008).

The scattering of deaf children throughout schools also makes it harder to generate evidence on 'what works' in deaf education. 80% of public schools are believed to have three or less deaf students. The ethnic, aetiological and intervention profiles have changed dramatically over the last 15 years resulting in increased student diversity (Mitchell & Karchmer, 2006).

There are however some consistent pedagogical features of teaching children in Sign Language.

All teachers use a multimodal presentation of both languages (sign, print, pictures, fingerspelling) in order to make the language meaningful. Stories are typically told in Sign Language and repeated until the story becomes familiar. Nation's techniques of repetition, analysis and enrichment are used. Subsequent re-readings are also in Sign Language but follow the English word order of the book (Paterson, 1994).

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Reading aloud and seeing the print is the normal process of learning to read for hearing children. Deaf children however need to see the print and see it signed as closely as possible. Children watch the signing in the periphery and also look at the text with the teacher sitting at right angles to the student.

Most of the literature supports mouthing, speech and sign-based assistance through signs and fingerspelling to bridge them. The importance of being explicit about the use of Sign Language, English and any English-based signing is emphasised by a number of researchers (Swanwick, 2002).

One experienced teacher noted:

With deaf children you can't teach English through English, you have to use ASL. This makes the constant translation and switching between the two languages an ongoing part of the school day.
(Evans, 2004 p 21)

Classroom practice should be based on the planned use of Sign Language and English as appropriate for the learning outcomes; the language repertoire of the pupils and the specific learning needs of individuals. Sign Language and English should be used as the language of instruction and assessment as appropriate but should also be explicitly taught and assessed/ monitored areas of learning in their own right. Pupils are likely to have one language that is more dominant (Swanwick & Gregory, 2008).

Sign Language and English should be used as the language of instruction and assessment as appropriate but should also be explicitly taught and assessed/ monitored areas of learning in their own right.

Teachers increasingly focus on the form of English as children progress, including attention to grammar translation as students construct English text from Sign Language narrative and letter combinations. One of the problems of Deaf learners of English is that they incorrectly over-generalise a comprehension and production strategy that they have learned for simple sentences: ordering a subject before a verb before a direct object. "The truck was hit by the car" is easily understood as the truck did the hitting (Pribanić, 2006).

Literal translation can also be a problem for some students. For example, prior to reading a story that involved a house with a dirt floor, there was a discussion that this did not mean a dirty floor but that the floor was made of dirt. Meaning-driven teaching strategies that gave the students an active role in their own learning was considered most effective. More explicit word-based, rather than discourse-based language structures were seen as inconsistent with bilingual programmes. The more explicit the teaching, the less actively involved the student became in the teaching process (Evans, 2004).

Literacy strategies include indirect representation of English by translation in NZSL and more direct representation by "contact signing" (using NZSL words in English word order) and by fingerspelling. Fingerspelling proved to be a key strategic tool in linking the two languages.

"Chaining" is often used, including the visual representation of a word or by a chained sequence of fingerspelling, mouthing and signing and thereby emphasising the equivalence of language forms (Smith, 2003 pp 115 – 116). "Sandwiching" is a form of chaining in which the sign is sandwiched between fingerspelling of the word before and after the sign is given, thereby linking the word with a sign (Herman et al, 2008).

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Word maps were also often used to discuss different meanings of words.

Bagga-Gupta (2002) confirms that global lesson patterns, particularly mixed lessons of plenary and individual and/or group work, are most useful for supporting linguistic complexity. Deaf students prefer to learn in concrete and meaningful contexts (Marschark & Spencer, 2003).

Metalinguistic awareness of English and NZSL as separate languages is considered vital. Emphasis is given to the different ways of expressing equivalent meaning and engaging students in analysis of sign and print word forms.

Metalinguistic awareness of English and NZSL as separate languages is considered vital.

Whole-language proponents argue that exposure to the second language in print can make up for the lack of an oral language (Marschark & Spencer, 2003). Many researchers criticise the teachers focus on sentence structure to the exclusion of other aspects of language (inferencing, paragraph structure, conversation and story structure as a transmission of sequenced information) (Pribanić, 2006; Wilbur, 2001). Furlonger and Massa (1998), however, argue that both the whole language approach and the code-oriented approach need to be used in bilingualism, and that too often the former dominates. Phonological learning can occur though, and Wilbur (2001) cites the ability of Chinese people to learn Mandarin as proof that people do not need to pronounce a language in order to write it.

There are copious amounts of information for supporting signing children in classroom environments (Watson et al, 1999), particularly around the need to look at information before it is discussed, the need for social relationships to be encouraged and for signing to be seen positively. Primarily deaf children need to be seen in terms of their strengths in using a different modality, rather than their deficits.

While there is not a large amount of literature on teaching mathematics bilingually, it is clear that school factors, including teacher qualifications and effectiveness, appear to have the greatest effect in mathematics performance (Powers & Gregory, 1998).

9.1 Curriculum

Wilbur (2001) speaks for many when she argues that a clear goal of deaf education is to provide access to an age-appropriate curriculum in all areas.

There is a growing acceptance that all content areas of the curriculum should use all lessons as ways of expanding cognitive and language abilities, especially vocabulary. Some contend that the differences in linguistic and cultural contexts mean that different objectives and assessments need to be used with Deaf children. Others argue that teaching deaf people can be optimised in any situation and that the same curriculum and assessments can be used to teach the same outcomes using Sign Language. Changing the curriculum is therefore contentious except for the teaching of NZSL and Deaf Studies (Marschark & Spencer, 2003).

What is agreed is the need for openness, experimentation and modification of strategies depending on student need to focus on learning objectives in the core learning areas. Marschark

and Spencer (2003) note the criticism that the training of teachers of the deaf lacks sophistication in understanding modern curriculum and methods.

9.1.1 General Language Assessment

From the moment deaf children are placed in school settings, language development is a primary educational goal. The accurate and authentic assessment of a deaf child's language development is crucial (Prezbindowski & Lederberg, 2003).

A variety of vocabulary assessments are advocated, including naturalistic and elicited language samples, parental diaries and checklists; tests can be appropriate, each with their own limitations. Prezbindowski and Lederberg (2003) advocate for the use of the Communication Development Inventory for very young children, Peabody Picture Vocabulary Test and Expressive One Word Picture Vocabulary Test at age 30 months or more in the US.

A variety of language assessment approaches are needed, including:

A variety of language assessment approaches are needed.

- Criterion-referenced tools
- Norm-referenced instruments
- Analysis of student samples
- Questionnaires
- Interviews
- Observations (checklists).

Yoshinaga (1997) supports interactionist theories that state that many aspects of development such as social-emotional, cognitive, linguistic, perceptual and physical skills influence and modify and may be dependent on one another in the course of language acquisition. Understanding that multiple interacting processes are taking place, rather than serial processes or operations performed sequentially has significant implications for understanding language acquisition.

Many aspects of development such as social-emotional, cognitive, linguistic, perceptual and physical skills influence and modify and may be dependent on one another in the course of language acquisition

Yet most assessment tools assume a modular perspective, for example examining syntactic development or grammar, or vocabulary. They have provided little information about:

- How to help children develop typical rule systems
- What characteristics predict mastery of grammar rules
- How the acquisition of some aspects of language influence the acquisition of other aspects (Yoshinaga, 1997).

Recommendations are made to assess comprehensively to identify variables that may be restricting semantic development, such as determining flexibility and rate of acquisition of vocabulary, determining preferred mode for expanding vocabulary, identifying the student's key strategies and cognitive ability for obtaining information and interpreting meaning, style of lexical learning (Yoshinaga, 1997).

Syntactic development is thought to often peak at the age of 12 or 13. Recommendations for comprehensive approaches to syntax assessment include determination of the student's comprehension of syntactic structures, primary modality and the use of different forms. Recommendations for teachers include (Yoshinaga, 1997):

- Identify language strategies that the student is using and whether they are successful
- Compare the language to that of normal hearing peers of the same age in syntax, semantics and pragmatics
- Determine the extent to which the language reception is dependent on auditory versus visual perception abilities
- Determine the student's developmental profile
- Include information about the context of the evaluation, such as the conversational partner, and
- Investigate the interrelationship of each aspect of the language for the individual student: syntax, semantics and pragmatics and phonology.

9.1.2 Sign Language Assessment

There are few standardised assessment tools that can effectively provide a detailed evaluation of a deaf student's ability to use the language efficiently (Mann & Prinz, 2006). Instruments are particularly difficult to develop when language input for deaf children is so variable and may include a natural Sign Language or sign systems. Assessments need

There are few standardised assessment tools that can effectively provide a detailed evaluation of a deaf student's ability to use the language efficiently.

to target specific linguistic forms and functions (Mann & Prinz, 2006).

Of 100 staff surveyed in US residential bilingual schools, 49% stated they were not aware of any regular Sign Language assessment at school. Most commonly used were a variety of strategies including observation checklists and video recordings and it was preferred that more than one person be involved in the assessment (Mann & Prinz, 2006).

While there are some instruments of assessment available, they still need to be proven valid and reliable. They are also complex and require a sophisticated understanding of Sign Language linguistics and their acquisition as well as assessment, which in turn requires highly trained staff (Marschark & Spencer, 2003).

Swanwick and Gregory (2008) note that tools for the assessment of children's BSL have been developed. They agree that the tests are limited by the age of participants, a lack of large sample norms and valid psychometric properties.

Three elements were considered most important to assess (Mann & Prinz, 2006):

- Language comprehension
- Language production, and
- Communicative competence.

9.1.3 General Assessment

Assessing general outcomes for deaf children is plagued with difficulty. In the US, standardised test scores are considered the best, if not only, indicators of academic achievement, as subject grades are prone to too much variability or measurement error. Most research in the area has been limited to the analysis of norm-referenced standardised tests (Marschark & Spencer, 2003).

Accommodations in general curriculum-related assessments (e.g. longer times, use of interpreter) all bring into question the accuracy of the assessment. Yoshinaga agrees that pragmatic assessments can be inappropriately based on hearing norms, provide incomplete or inappropriate checklists, ignore the context of communication intent and focus on age-matched peers (Yoshinaga, 1997).

10. Settings

Sign Language users might be based in a mainstream, Deaf education satellite unit class within the mainstream or within a Deaf Education Centre.

There is little empirical evidence that some settings are better than others, although opinions vary significantly.

There is little empirical evidence that some settings are better than others, although opinions vary significantly. Little research has been reported on the relationship between location, teaching and outcomes (Marschark & Spencer, 2003).

Different settings tend to offer different approaches. For example, in the UK 70% of deaf mainstream students are taught their auditory-oral methods, while 70% of children in deaf schools are taught using a manual visual system (BSL or TC) (Powers, 2002).

Educational placement (mainstream or special school) does not appear to influence reading performance when other factors are taken into account. A number of studies record greater performance against mainstream placement but have not accounted for some issues such as children with additional disabilities (Powers & Gregory, 1998).

The median performance of special school students was lower than integrated (mainstream) students in the US, but the highest 20% were achieving as well as or better than integrated students. The lowest performance was found among those “minimally integrated” (self-contained classrooms in mainstream schools). Student placement did not explain achievement and in fact may simply respond to performance or language differences (Marschark & Spencer, 2003).

Clearly, more research is required to identify optimal environments for children with different skills, backgrounds and language preferences.

11. Accessing Curriculum through Sign Language in the Mainstream

11.1 The Challenges of Inclusion

More than 90% of deaf children in Britain are educated in mainstream settings. More than half of profoundly deaf children enter school with a cochlear implant (Swanwick & Gregory, 2008).

The policy of inclusion or placement in the mainstream is international. The term implies that all children are members of our communities and accommodations will be made for all learners in our schools. The classroom is expected to adapt to meet the child’s needs.

Inclusion has served many disabled children very well but communicating differently or being without direct conversation with teachers and peers can create a restrictive environment for many deaf students. The policy of mainstreaming is seen by some as mode restrictive in that the child is expected to adapt (Marschark & Spencer, 2003).

Powers (2002) argues that inclusion is a concept that is unhelpful to deaf children and that a broader concept is needed that enables the child to be included in society for the longer term. For some deaf children, special school education is more appropriate to achieve this goal because it can allow access to the curriculum and peers.

Concern is expressed throughout the literature that inclusive environments do not adequately consider social, self-esteem or identity needs. Peer mediation needs to be consciously encouraged among deaf students, unlike among a group of hearing students (Marschark & Spencer, 2003).

Komesaroff and McLean (2006) criticise the often unconscious "ableist" understandings entrenched in inclusive philosophies, the pathological model of deafness and the deficit pedagogy that centres on the acquisition of speech and social assimilation. With most Deaf children mainstreamed, the language of instruction is the primary disabling factor that the children encounter. Mainstreaming can result in cultural and linguistic isolation.

Despite the best efforts of mainstream teaching staff, they still frequently do not provide a Sign Language user with adequate linguistic, academic and social participation in a learning context configured for hearing students. Examples are given of deaf children working quite differently from the rest of the class because of lack of prior knowledge required for the lesson, lack of a strong language base and lack of skilled interpreting (McKee & Biederman, 2002). Similarly, Cawthon (2001) noted that teachers directed fewer utterances to deaf than to hearing students. Deaf students were generally not part of the classroom dialogue. Interpreters were providing more support than just interpreting and extended to explaining lessons and cueing for attention to task. Students also reported few or no meaningful social relationships with other students even with good interpreting available (Russell, 2010).

Despite the best efforts of mainstream teaching staff, they still frequently do not provide a Sign Language user with adequate linguistic, academic and social participation in a learning context configured for hearing students.

Deaf paraprofessionals identify linguistic isolation, lack of Deaf-appropriate teaching strategies and over-dependence on teacher aides as primary barriers to success (McKee, 2003).

In a 2003 NZ survey of deaf mainstream students, 94% of children identified as having high or very high needs were severely or profoundly deaf, and 33% used Sign Language to communicate. A large number of oral students had difficulty communicating and inadequate levels of auditory therapy. A low level of competence in teaching staff and families was found. 83% of mainstream teachers nevertheless believed they could communicate reasonably well with their deaf student but many ironically reported difficulties with assessment (McKee, 2003).

Similarly, Russell's case studies of the use of interpreters in Canadian educational settings showed that many schools do not employ qualified interpreters, thereby affecting the quality of education for students. She observed that group processes and debates are generally not handled well by interpreting even when they are qualified. Teachers were generally satisfied that the deaf child's needs were being catered for but the students were frustrated with the level of accuracy of information (Russell, 2010).

One child was getting less than half of the class content because of inadequate skill in interpreting, despite being an experienced uncertified interpreter. Interpreters and language assistants need to be fluent language users (Russell, 2010).

It is not just a matter of language. The traditional simultaneous visual-auditory learning experienced by hearing children contrasts significantly with the sequential visual approach used by many deaf children (Shaw & Jamieson, 1996).

Russell concludes that teachers can be oriented to develop strategies that include Deaf children, such as preparing lessons with the interpreter, ensuring adequate pauses, calling on the deaf child to answer, use of the board visual cues, and reduction in dual simultaneous requirements. More time for processing and clarifying was required than was available in a regular hearing-focused class.

Teachers of the Deaf and Teacher Assistants were able to provide greater monitoring of comprehension and engagement strategies, including use of metacognitive questions and language modelling. The importance of independent auditing was emphasised (Russell, 2010).

Mainstreaming has also had an effect on the ability to conduct effective research on students, as it is more difficult because students are widely dispersed and difficult to locate (Reed et al, 2008).

There is no centralised system for recording data on academic achievement of mainstreamed students in New Zealand (McKee, 2003).

11.2 Successful Inclusion

Komesaroff and McLean (2006) argue that inclusion as equals cannot exist where deaf students have to make all the accommodations. For real inclusion, all teachers and students need skills in Sign Language and Deaf culture. Acknowledging and accepting social and cultural difference promotes greater equality of interaction (Komesaroff & McLean, 2006).

For real inclusion, all teachers and students need skills in Sign Language and Deaf culture.

While Sign Language advocates have been largely disappointed by the actual amount of inclusion deaf students usually receive in mainstream settings, there are some successful examples available.

- Brazil has adopted a Hamburg model, with inclusive schools specialising in supporting only deaf students in ordinary classrooms from the third grade. In earlier years they are separated in the school and deaf students are taught Sign Language and Portuguese. Up to six deaf students are incorporated into each mainstream classroom of around 25 students. The class operates bilingually with two teachers and has a strong focus on metacommunication strategies (communication about communication).
  Language is the most meaningful symbolic tool of the human condition and involves mutuality and co-construction, negotiation of meanings. Metacommunication was observed in gestures, postures, looks and subtle voice intonation for example, revealing beliefs and motivations while interacting with the students. Together with drawings, writing, movements and mimicry, meaning-making mechanisms are activated that foster human development (Kelman & Branco, 2009).

While Sign Language advocates have been largely disappointed by the actual amount of inclusion deaf students usually receive in mainstream settings, there are some successful examples available.

- One Australian mainstream teacher wrote about her experience of establishing a bilingual class in a mainstream setting. She learned Sign Language and encouraged all the children in the class to do so. The hearing children were so enthusiastic that signing spread across the school and the classroom became fluent enough by the end of the year that some classes were held in Sign Language without interpreters. They were taught to respect the culture of the deaf and Deaf adults frequently visited the classroom. Hearing students learned a lot about their own language through contrasting the two languages. Gordon argues that equal access is dependent on a new and innovative approach to deaf education rather than relying on an interpreter and teacher of the deaf (Gordon, 2004).

- The No Child Left Behind Act (2001) in the US has left educators seeking solutions for a major literacy dilemma, as the Act requires that all students achieve performance at grade level by the end of 2013 – 2014. Dual language methodology has generated some positive results (DeLana et al, 2007), although bilingual programmes are still relatively rare. The Centre for ASL/English Bilingual Education has trained 274 mentors over 10 years to train in-service teachers in 20 school sites and eight university programmes across the US. The lack of rigorous quantitative research is criticised.

  In one study, 25 deaf students from preschool to 12th grade, without any cognitive or additional disabilities, in a public school were analysed (DeLana et al, 2007). The school made a huge effort to collaborate, seek appropriate expertise and improve educational practice, which generated positive results for deaf students. The school demonstrated what was possible with good language models, including deaf teachers, opportunities for formalised training, and an adequate critical mass of deaf students and qualified staff, including interpreters (DeLana et al, 2007).

All scores increased with age over the seven years of data and the greatest gains were experienced after the age of 12. The plateau effect did not occur in the sample of teenagers and all students were either at grade level, above it or within two grade equivalencies (DeLana et al, 2007).

Extensive staff training, including cultural and language development, took place between deaf and regular teachers. Videophones were included throughout the school, deaf staff were recruited and deaf students were regularly involved in extracurricular activities (DeLana et al, 2007).

Vertical teams were established to ensure that the vertical path that students took from one grade to another was aligned. Certain bilingual practices were observed, including language separation during literacy activities, facilitation of metalingual awareness, the use of contrastive linguistic models for grammar instruction and bridging. Instructional strategies included free and literal translations, chaining, sandwiching, preview-view-review, concurrent approaches and translanguaging (DeLana et al, 2007).

- One study showed that hearing students in the co-enrolled classroom had better Sign Language and a more-positive attitude to deafness, and an improved awareness of certain aspects of hearing loss (such as speech and amplification). Deaf and hard of hearing students' social acceptance was similar to that of their hearing peers. It was found, however, that a significant amount of time and collaboration is required to make it a successful experience, as both teachers are responsible for educating all the students and requires time to plan together and discuss teaching styles and classroom expectations (Bowen, 2008).

  Team approaches are recommended that include the classroom teacher and teacher of the deaf cooperating to develop resources and strategies for the entire class, including the deaf. Provision of multimedia materials is essential for teachers. The co-enrolment option seems promising because it combines the best of all options allowing a strong interaction with both deaf and hearing cohorts (Marschark & Spencer, 2003).

Indicators of inclusion for Deaf students in mainstream schools:

- Whole-school approach to special needs where positive approaches are promoted
- Regular opportunity for interaction between deaf and hearing students
- Regular opportunities to mix with other deaf students
- An effective communication environment for each child
- Access to the formal curriculum
- Skilled teachers and assistants

- Involvement in extra-curricular activities
- Access to Deaf culture and deaf adults for deaf students
- The involvement of deaf students and their parents in placement and curriculum chosen
- The involvement of deaf adults in educational policymaking
- High academic and non-academic achievement
- The rates of inclusion are much easier to measure than the quality of inclusion (Powers, 2002).

11.3 Factors for Success in Inclusion

Luckner and Muir (2001) and Reed et al (2008) attempted to identify from parents, teachers and students themselves what contributed to developing successful students in mainstream settings and it was concluded that the following factors were most important:

- Family involvement
- Self-determination
- Extra-curricular activities
- Social skills/ friendships
- Self-advocacy skills
- Communication with and support for general education teachers
- Pre-teach/post-teach content and vocabulary being learned in the general education classroom
- Collaboration with early identification and early intervention services
- Reading
- High expectations.

Detractors included additional disabilities, family use of a language other than the majority language, and poor family-school communication.

School factors that promote success include administrative support, adequate resources, adequate scheduled time for teachers to plan with special educators and to make adaptations, and scheduled in-service training for general teachers (Reed et al, 2008).

Classroom factors promoting success include the amount of classroom time devoted to the academic curriculum; teacher attitudes toward inclusion; teacher support of peer relationships; respectful relationships between general and special educators; and special education assistance that is not disruptive (Reed et al, 2008).

Specific support services that impact on academic achievement include the degree and type of support provided by the specialist teacher; access to classroom communication and academic information through appropriate amplification and/or accurate Sign Language interpreting and note-taking; and adequate opportunity to participate in extra-curricular activities (Reed et al, 2008). Like Yoshinaga, Reed et al conclude that these variables are not independent of each other.

11.4 Working with an Interpreter in a Classroom

Siple notes that many teachers can easily assume that the interpreter will take care of the deaf student in the classroom, but that this can restrict the students' participation in the classroom and also not provide any benefit to the other students.
Having an interpreter does not automatically mean that integration will occur. Research has shown improved educational experiences when the teacher understands the role of the interpreter and takes steps to manage the classroom communication dynamics (Siple, 1993).

Having an interpreter does not automatically mean that integration will occur.

The interpreter is trained to interpret everything possible for the student, including irrelevant messages and jokes. They will not take part in the classroom and will avoid offering an opinion even if asked directly.

All children should be given some information on how best to use the interpreter at the beginning of the class. The interpreter should get a summary of the programme and key learning ahead of time. Breaks should be factored in (Siple, 1993).

One study, similar to local case studies, showed that in an elementary setting in the US with a child integrated with an interpreter, the student primarily interacted with the interpreter and received more instruction from the interpreter (38%) than the teacher (26%). The teacher was unaware that the child felt left out or that he needed different ways of approaching the problem. The teaching was largely one way with an emphasis on instruction rather a demonstration of what was learned (Shaw & Jamieson, 1996). Because it was necessary to take a longer time to explain some concepts, not all information was interpreted. The child missed out on significant information around the cultural rules for interaction in the class because of the focus on academic achievement. Physical proximity did not guarantee access to the academic social or cultural experience of the other students (Shaw & Jamieson, 1996).

...the student primarily interacted with the interpreter and received more instruction from the interpreter (38%) than the teacher (26%).

Improvements are possible by more focus on Individual Education Plans that the teacher assumes responsibility for and in consideration of class discourses (pace of communication, actual content of discussion) (Shaw & Jamieson, 1996).

Schick et al (1999) evaluated 59 educational interpreters using the Educational Interpreter Performance Assessment (EIPA) in the US. The results showed that not all of the educational interpreters were qualified to provide a child with an adequate interpretation of classroom discourse. Less than half of the educational interpreters performed at a level considered minimally acceptable. Sign vocabulary was significantly better than grammatical skills. It was concluded that many deaf children receive an interpretation of classroom discourse that may distort and inadequately represent the information being communicated (Schick et al, 1999).

12. International Models

12.1 Scandinavia

The Swedish Government passed a law in 1981 stating that deaf people need to be bilingual in order to function effectively in the family school and society. Deaf children then began to automatically be educated in Swedish Sign Language and Swedish with a focus on literacy (Mahshie, 1995). From the early 1980s to the mid 1990s, the numbers of pupils at special schools increased when Sign Language was recognised as the language of instruction although the number fell after 2000. Special schools are primarily used for children who want a bilingual environment (Hendar, 2009).

Mahshie notes the key differences in Swedish and Danish systems that are responsible for their success:

- Early services and approaches to deaf children and their parents. Parents need the support of other parents of Deaf children and it is considered vital that their children interact with other deaf children and adults who sign. The high priority on early services means that young preschool children are transported if necessary to the nearest preschool with Deaf teachers and support staff. Other possibilities include staying with a Deaf family for limited periods, hiring a Deaf babysitter, extended visits to the Deaf school or even relocation so that they can be closer to services, support and socialisation.

- Sign Language courses are provided for parents in intensive one to two-week blocks or at least intensive weekend courses and are considered more effective than periodic short classes. The support and socialisation of other parents are also considered important.

Sign Language courses are provided for parents in intensive one to two-week blocks.

Deaf Clubs are encouraged to think of themselves as responsible for developing better futures for Deaf children and so they often host parent meetings and Sign Language courses.

- Approaches to teaching Sign Language and the majority-spoken language.

  Norway also offers parents 40 weeks of training in NSL through the first 16 years of the child's life, with full coverage of tuition, travel and accommodation and loss of earnings (Swanwick & Gregory, 2008). Teachers and speech therapists consistently remarked how knowledgeable and well adjusted the deaf children were on school entry, something they consistently attributed to exposure to Sign Language among parents and preschools (Davies, 1991).

- Positive attitudes of educators and medical professionals to Sign Language, the Deaf community and minority languages in general (Mahshie, 1995). Deaf students are seen as a minority group who do not need remedial teaching, but rather need their special linguistic situation addressed.

Positive attitudes of educators and medical professionals to Sign Language, the Deaf community and minority languages in general.

  The early intervention system was restructured and a major focus was put on the re-education of professionals across the medical, social work and preschool system on the basis that no amount of excellent teaching can make up for losing the opportunity for crucial language learning in the early years.

  Major changes in coursework and entrance requirements have been implemented for new teachers. New Deaf teachers were hired but it was also clear that current teachers need to be upskilled in Swedish Sign Language as many used either different forms or little Sign Language. Every year, from 1989, 20 teachers were funded for one semester to learn Sign Language full time in a programme specifically designed for them. This course continued and was expanded to ensure teachers were adequately skilled in the language of instruction (Mahshie, 1995).

  Teachers of the Deaf found the change confusing and distressing but have embraced the challenge and want to be good signers. Many took regular in-service training blocks in Sign Language (Davies, 1991).

A bilingual environment is seen as supportive to hearing-impaired as well as deaf children (Hendar, 2009). Speech is seen as a complement to but not an essential component of educating the deaf in Sweden. Grade-level academic achievement is widely considered critical and intensive speech training is weighed in a "cost benefit approach". 27% of children with cochlear implants are taught through spoken Swedish but all pupils are expected to be bilingual when leaving school (Swanwick & Gregory, 2008).

For children with little or no auditory access to speech, spoken language learning is considered more of memorisation task. Speech is therefore not considered as falling under the *critical period discussion* as it applies to first-language acquisition. Cognitive readiness and motivation are considered critical for the task of learning speech at a later point (Mahshie, 1995; Davies, 1991). Mahshie tells of an American boy explaining that after he learned to sign and read, he was much more easily able to learn to speak because he had acquired the basic concepts of language. Speech therapists work closely with Sign Language teachers (Pribanić, 2006).

Deafblind children are also admitted to deaf schools. Children with learning disabilities are at specific compulsory schools and the proportion of children with hearing loss is large (Hendar, 2009).

Mainstreaming in Sweden tends to be limited to hard of hearing children who can function in a classroom without an interpreter (Mahshie, 1995). While mainstreaming in public schools is an option, almost no parents choose it having seen the educational and social benefits of placing their children with Deaf peers and adults.

A key difference in Scandinavia is the size of classroom. Educators have come to believe that large classes (around 24 in a class of 12 year olds) are advantageous to deaf students because they can learn cooperatively from their peers through small group work, and further develop their sense of identity, and this also allows team-teaching strategies. Students can change work groups depending on their learning styles and skills, as well as subject matter, and this is considered better than small static groups based on speech or reading skills. The importance of learning from each other is emphasised as well as the ability of deaf children to cope in larger environments as long as they have had early exposure to language (Mahshie, 1995).

Grade-level texts are used and translated in all areas except reading. Videotapes of classic stories are often used and discussed in Sign Language and then presented in written Swedish with an interpreter and a study is made of how the languages differ. Teachers are supported by a part of the curriculum which breaks down parts of the grammar of both languages so they know which of the parallel linguistic concepts can be introduced at different ages. Writing is started in the second or third grade. Denmark has produced detailed books by R Sorenson about their methods and experiences at different stages (Davies, 1991).

Special schools are expected to have similar goals in the curriculum to compulsory schools, and expected to adapt their environment to meet their students needs with one extra year of operation. There is some leeway in the knowledge area of goals but assessments carried out are relatively similar (Hendar, 2009).

The key issues discussed in debates around special schools include: the teaching of language (signed and spoken), type of boarding, teaching models (whole-word versus sound-based learning), attitudes to spoken language and hearing (speech and sign, speech only, quiet, signing), and type of organisation and its funding source (national, regional, local) (Hendar, 2009).

12.2 US

The US Annual Survey of students in 2001 (Marschark & Spencer, 2003) showed that:

- 32% of deaf students are in a mainstream setting, with some access to a teacher of the deaf or interpreter
- 13% are in resource rooms based in ordinary schools where students participate in many mainstream subjects
- 28% are in self-contained classrooms in ordinary schools with a teacher of the deaf
- 25% are in special schools.

Proportionately more African Americans and Hispanics tend to be based in special schools. Similarly, more severely and profoundly deaf students are based in special schools or self-contained classrooms (Marschark & Spencer, 2003).

Contact with deaf peers allows more friendships to develop and these are most able to be catered for in all but the mainstream settings.

It is argued that contact with deaf peers allows more friendships to develop and these are most able to be catered for in all but the mainstream settings. Extra-curricular activities are also most able to be accessed in these environments (Marschark & Spencer, 2003).

Resource teachers of the deaf largely remove students out of the mainstream classroom to work with them (75%) and 15% of the time work in classes (Marschark & Spencer, 2003).

One model of co-enrolment is classes of equal numbers of deaf and hearing with team teachers delivering a programme in Sign Language and English. Because large populations of deaf people are needed to enable this model, it is quite limited in practice and is often short lived (Marschark & Spencer, 2003).

12.3 UK

Swanwick and Gregory (2008) describe a range of schools using bilingual approaches:

- Blanche Nevile School is a special school for deaf children aged between 2 – 19 years in London. It offers specialist teaching in small groups, reverse inclusion groups and support in mainstream classes. All children receive speech and language therapy in small groups and individually as needed. It is located on the same site as a local primary school and works closely in partnership with them. There is a continuum of inclusion where deaf

children are included in mainstream classes as needed and hearing children are included in Blanche Nevile classes.

- Elmfield School for the Deaf is a special school and regional resource for children aged between 3 – 16 years in Bristol. It has developed its bilingual practice over 10 years. The curriculum has been developed to reflect the bilingual approach to learning, including ensuring assessments in both Sign Language and English and a Deaf Studies curriculum. The school is in the top 5% nationally. It has close links with the Deaf community.

- Fred Barnes School is a centre of excellence in Deaf Education in London and has been granted Beacon status, awarded to schools that perform particularly well. This school also figures in the top 5% of all schools nationally. It provides specialist instruction for 33 – 45 deaf children aged between 2 – 11, has a high ratio of Deaf staff (55%), high expectations of students and an outstanding curriculum designed to meet the needs of deaf children. It is working on a pupil data analysis system to track individual pupil progress across subjects.

- Firbeck Primary and Nursery is a mainstream city school with an Individual Needs Centre and includes 11 deaf children on its roll of 208 pupils. Three of the 11 have cochlear implants. The Individual Needs Centre has 1.8 FTE teachers of the deaf and five teaching assistants, one of whom is deaf. Children are encouraged to decide for themselves whether to sign or speak. More voice without sign is used with the cochlear recipients.

  There are two groups of four children in two mainstream classes where a TOD or TA signs. The TODs and TA prepare the Sign Language content for the lesson in advance.

  The school feels constrained by curriculum pressures and initiatives in the mainstream setting to prepare quality models of Sign Language , access deaf role models and deaf studies teaching. There is a fine balance between withdrawing deaf children to teach them in small groups where it is possible to differentiate communication modes, and keeping deaf children in mainstream where all benefit from adaptations needed to communicate with hearing children. More support is needed for the families for language development (Swanwick & Gregory, 2008).

- The Leeds Sensory Service – Deaf and Hearing Impaired Team supports 450 children, the majority requiring access to the curriculum through Sign Language and are supported in both mainstream or specialist provision. The multi-disciplinary group includes teachers, communication support workers, bilingual family support workers, Deaf instructors, audiologist and technician, nursery, primary and secondary resourced teams. They are highly trained around issues of supporting children in bilingual settings.

Grimes et al (2007) note that while 60% of Scottish deaf children theoretically had access to Sign Language with supportive policies, the vast majority accessed the school curriculum only through written and spoken English. There were significant regional variations in the extent and quality of sign bilingual environments available.

13. Evidence-based Outcomes

Deaf and hearing-impaired pupils have different needs and different goals in school. They have different prerequisites and receive different types of support but many still do not achieve the knowledge goals (Hendar, 2009).

No one approach has been proven to be the solution to the problem of under-achievement of deaf pupils (Grimes et al, 2007).

There are many local studies of successes in bilingual and related programmes, and the Canadian Ministry of Education reports after 30 years of evidence that deaf children who acquire Sign Language as their first language are cognitively, socially and linguistically at levels that are developmentally appropriate. Their linguistic competence matches their hearing peers but they also have a better self-image and higher self-respect. They are less impulsive, behavioural disorders are rare, are more emotionally mature, more independent and socially better adapted (Pribanić, 2006).

Only two broad-based studies of the outcomes in measurable detail for deaf children were found and these were less convincing that the deaf education dilemma has been resolved completely.

One group has relatively normal reading development but there is still a large group that has difficulty in this area.

Sweden

Reading comprehension among deaf pupils does not have a normal distribution. One group has relatively normal reading development but there is still a large group that has difficulty in this area. There is some evidence that while it was normal in the early school years, the difficulties increased the older they became. Hendar refers to reports from the US and UK which also shows that many factors can hinder achievement and that higher expectations and knowledge requirements in the curriculum can leave many deaf pupils further behind. For this reason, many special schools work with value-based goals rather than knowledge goals (Hendar, 2009).

Pupils at special schools do not achieve all their goals. About 40% of the pupils were thought to have additional difficulties and for mainstreamed children, this was about 25%. 85% of the teachers at schools for pupils with learning disabilities said that such additional support was needed (Hendar, 2009).

Figure 1: Proportion of pupils in Sweden not achieving goals (2002 – 2006)

Type of setting	Not achieving goals in one or more subjects	Not achieving Swedish goals	Not achieving mathematics goals	Not achieving Sign Language goals
Special school	68%	44%	49%	22%
Schools for the hearing impaired	44%	16%	24%	17%
Individually placed in mainstream	32%	8%	13%	5%
Compulsory (all students in mainstream schools)	24%	4%	7%	14%

The difference between boys' and girls' performance is striking with girls regularly outperforming boys, even in mathematics. Boys from special schools or outside of Sweden find it most difficult to pass subjects (Hendar, 2009).

The Swedish state agency for deaf and hard of hearing bemoans that so few people outside special schools and schools for the hearing impaired learn Sign Language. By training more Sign Language teachers and by distance learning through internet and communication technology, this is expected to be redressed (Hendar, 2009). There are more pupils with spoken language wanting to learn Sign Language.

It takes longer to teach the same amount of knowledge in two languages than one. Teaching in small groups where the pupils' needs and levels vary greatly is also time consuming (Hendar, 2009).

Colorado

Despite successes in the early development of children in the CHIP programme, a 2002 state-wide analysis showed large gaps. Deaf and hard of hearing children gained only 1.5 years in literacy skill between the ages of eight and 18. Only 8% of deaf students graduate from college and the earning capacity of deaf children is on average 40 – 60% lower than their hearing counterparts. On average 70% of deaf students are still performing in the unsatisfactory/partially proficient range on tests and deaf students are performing at two to three years below their hearing peers. Moreover, results were deteriorating in the 1998 - 2001 period. (Colorado DOE, 2002).

However, this period does not capture all children who have been through the well-respected CHIP programme. A later analysis of the results for 269 deaf children in elementary and secondary schools during the 2002 – 2005 period (Johnson, 2010) showed:

- A small increase in linkages with Deaf peers and mentors (72 – 79%)
- A small increase in the numbers of children using speech at school (70% - 72%)

- An increase in the proportion of children using a mixture of sign and speech at school (20 – 25%)
- An increase in the use of speech and language (33% – 45%)
- Average scores of these deaf students in cognitive, social and communication skills that equated to mild limitation, as opposed to moderate or severe limitation.

Antia et al (2009) report on a 5 years study of deaf and hard of hearing students in mainstream classes for at least part of the day from Colorado and Arizona. They conclude that a majority of students are within the normal range of academic performance and are making one year's progress in one year periods, but on average, are half a standard deviation behind norms on standardised tests and despite the progress, may not be closing the gaps, particularly in reading.

13.1 Key Factors for Success

Academic achievement has been linked from various studies to socio-economic status, maternal education, ethnicity and gender. Europeans and Asians, girls and students from wealthier families are most closely associated with higher achievement in language and boys in mathematics. Also generally, the lower the level of deafness, the greater the gain in comprehension achievement (Marschark & Spencer, 2003).

Academic achievement has been linked from various studies to socio-economic status, ethnicity and gender.

Age of identification, other handicaps, parental support and ethnicity are also key factors affecting achievement and placement (Marschark & Spencer, 2003; Powers & Gregory, 1998; Pribanić, 2006; Antia et al 2005).

Age of identification, other handicaps, parental support and ethnicity are also key factors affecting achievement and placement.

The universal newborn screening programmes changed the age of identification from an average of 20 months to two months over nine years from 1994. Language development is positively and significantly affected by the age of identification and age of intervention initiation. Both speech development and social-emotional variables are highly related to language development (Yoshinaga, 2003).

Higher socio-economic status was not associated with better language development in the Colorado CHIP programme (Yoshinaga, 2003). It was thought that this may indicate that the home intervention programme provides an equalising effect with the normal advantages associated with greater income and higher education.

Similarly, Barber and Mourshed (2007) note that the top-performing (general rather than deaf education) schools in the world had approaches to ensure the school can compensate for the disadvantages resulting from the student's home environment. All placed a strong focus on numeracy and literacy with clear evidence that early ability in core skills is strongly correlated with

positive future outcomes. They also all recognise that they cannot improve what they do not measure.

The best school systems in the world all have three things in common: Getting the right people to become teachers; Developing them into effective instructors and; Ensuring the system is able to deliver the best possible instruction for every child (Barber & Mourshed, 2007).

The Colorado Department of Education states that expectations that deaf students achieve the same as all students is essential, as is placing people in programmes based on their communication needs. Students should also be able to participate in all educational and social experiences, including activities with normal hearing students and adults, as well deaf peers and adults (Colorado DOE, 2002).

Colorado suggested the following was needed to close the gap for deaf students: more access to qualified interpreters, programme guidelines on standards of practice, staffing patterns, and case load recommendations; good teacher in-service training and quality teacher evaluations, as well as a coordinated state-wide regional education system in which parents and community are educated and collaborate. Detailed recommendations are made on how best to support deaf children. Audiologists are also asked to consider the child's language and communication needs (Colorado DOE, 2002). This is similar to the principles and goals of the 2005 New Zealand National Plan for Deaf Education, yet to be formally implemented.

13.2 A Student View

Byrnes and Sigafoos (2001) reported on an analysis of the views of 140 Australian deaf and hard of hearing students in integrated or self-contained high school classrooms. 82% of the students in separate settings had severe or profound hearing loss compared to 52% in integrated settings. 80% of all students said they were satisfied with their current placement suggesting that either, students adapt to conditions, or placement is generally appropriate. Just over a quarter (27%) had been to both types of education.

Nearly half (49%) preferred to go to their local school, while 39% preferred some separation in a special class or school. Over half, however, thought there should be a special school for the Deaf and 40% thought there should not be. More than half (53%) preferred to attend a placement where there were at least some other deaf or hard of hearing students. They addressed the positive aspects of separate schooling (easier to communicate, comfortable with other deaf students) as well as the negative (lack of interaction with hearing people, will not learn skills for the hearing world) (Byrnes & Sigafoos 2001).

Students in integrated settings were more likely to have a mild/moderate hearing loss, to have hearing siblings, to have English as a home language and to be placed with at least one other deaf or hard of hearing student (Byrnes & Sigafoos 2001).

A group of nine to 11 year olds in a bilingual setting were clear that they hated learning English even though they knew it was useful for their future. They resented being outnumbered by hearing people who spoke English, as Sign Language was so central to their lives (Sutherland & Young, 2007).

A group of nine to 11 year olds in a bilingual setting were clear that they hated learning English even though they knew it was useful for their future.

One piece of research on 25 children from two bilingual programmes demonstrated that the children valued Sign Language for the facility it gave them to communicate, form relationships and to participate at school. They also saw English as important and a significant factor in interacting with the hearing world (Swanwick & Gregory, 2008).

13.3 A Family View

Yoshinaga criticises the frequent lack of representation at decision-making level in determining programmes and services for their children, despite retaining the "case manager" role. Parent satisfaction could be easily determined through regular electronic surveys (Yoshinaga, 2010).

Diversity and adults with hearing loss have similarly been under-represented in decisions for programme development (Yoshinaga, 2010).

There is agreement among families and educators that there is a need for a range of seamless and comprehensive services from which a unique approach to each student can be selected (Fitzgerald, 2000).

Allen (2002) found that when information with a "deaf perspective" is provided and certain classroom conditions are met, families are empowered with new attitudes about deafness. A balanced approach in the presentation of information is needed from both deaf and hearing perspectives, based on information provided by and interactions with teachers, families and deaf community members. Information about the benefits of being bilingual and a clear expectation of the whole family becoming bilingual, encouragement to interact with deaf community members and a collaborative classroom model are all considered essential parts of providing this balanced perspective.

Migration theory is used to describe the parental experience of raising a child who is potentially a Deaf community member, with deafness as a cultural and linguistic status. Laing argues that taking a purposeful journey towards the Deaf world gives parents a clearer path to support positive identity and language competence for their children (McKee, 2006).

Parents though are far more likely to see deafness as a disability and to be encouraged to make their child fit in with the dominant culture (McKee, 2006).

Parents though are far more likely to see deafness as a disability and to be encouraged to make their child fit in with the dominant culture.

11% of families surveyed had started to sign but had stopped after schooling started due to advice following the cochlear implant; signing was seen as only a tool to access speech, a wish to normalise the child's language at school, and a lack of opportunity to further their language skills. Some parents also felt rejected by contact with Deaf community members. Many parents do not see the value of mixing with deaf peers or adults. Signing can be seen as limiting access to inclusion and stopping signing is seen as increasing access to language (McKee, 2006).

Sawiki 's 2008 research in New Zealand on parents of children with cochlear implants suggested that the referral process was erratic and that the hearing aid trial was a source of stress and frustration with little benefit. She concluded that cochlear implantation was a management tool rather than a cure for deafness and that implanted children continue to face significant challenges in a hearing world. She noted the low use of Sign Language among these children suggests a lack of a holistic and pluralist approach to language development. She postulates that with minimal contact with the Deaf community or its language, and pressure to function as "hearing" these children may face additional challenges in the future.

McKee concludes that stronger mechanisms are needed to connect parents to Deaf perspectives. Deaf paraprofessionals as mentors for children and families enable an alternative construction of deafness but intercultural diplomacy is needed to build environments of trust (McKee, 2006).

Research in the UK has consistently shown that parents of deaf children perceive with hindsight that professional services did not make them fully aware of the range of choices available in supporting their child's linguistic and social development. Concern centres around bias of information and professionals, and around education policy positions (Young et al, 2006).

The provision of unbiased information is not necessarily straightforward. Parents do not necessarily want an empowerment model and sometimes prefer an "expert model" while others may have a passionate commitment to one of the options available. Broad-based research was undertaken to identify key themes on information provision for decision. Key themes that emerged were:

- Information should be evaluative, not just descriptive, and should draw attention to the risks and benefits of each choice.
- The difficulties of information for a purpose includes the fact that information should be part of a discussion rather than a static activity and it may be best to promote participation rather than a specific decision.
- The origins and status of the information. Information should be accurate, up to date and evidence based, where possible.
- Informed choice and understanding. Choice is an organic process rather than a one-off decision based on information.
- Informed choice as an absolute and relative concept. Is it more important to understand the choice as desirable or achievable in a universal sense or within a specific context?

- Preferences and presumptions of rationality. Sometimes we make decisions based on many factors that others may not see as rational, such as values, finances, culture, or gut instinct.

- Informed choice for whom? Individual rights and social responsibilities can compete when decisions are made on behalf of a child (Young et al, 2006).

14. Deaf Children with Disabilities

There are consistent reports that 30 – 40% of deaf and hard of hearing children also have other disabilities (Wiley et al 2007), including learning disability, intellectual disability, cerebral palsy, attention deficit disorder and emotional/behavioural problems (Luckner, 2001). Cognitive and behavioural disabilities will have more impact on achievement than physical disabilities (Marschark & Spencer, 2003).

30% – 40% of deaf and hard of hearing children also have other disabilities.

The combination of deafness with an additional disability is multiplicative rather than additive (Wiley et al, 2007) and can result in degrees of impairment across several domains (e.g. communication, cognition, affective, social, behaviour or physical). Educators working with deaf children need to understand typical benchmarks to identify development that is atypical for children who are deaf. Indicators of additional disabilities and appropriate assessments have been identified (Wiley et al, 2007).

Luckner argues that there are a lack of psychometrically sound assessment techniques for this population and that evaluation and collaboration is required by professionals across multiple areas. Teachers of deaf students are considered to have little training in working in multi-disciplinary teams, in the US at least (Luckner, 2001) and a list of general and specific knowledge is listed as available . There is also considered to be a shortage of curriculum methods and material for this population.

Assessment is needed by someone fluent in the student's preferred language as well as knowledgeable about disability. For example, deafblind students require a very different educational service, often through touch. Intellectual disability can often be misdiagnosed because of deaf students' poor reading and speech skills (Marschark & Spencer, 2003).

Luckner (2001) details the competencies of working with students with hearing loss and additional abilities.

Roth (1991) also stresses the importance of collaborative relationships between deaf educators and disability specialists, yet notes the gaps in terms of their training and location of programmes.

Roth (1991) also stresses the importance of collaborative relationships between deaf educators and disability specialists, yet notes the gaps in terms of their training and location of programmes.

Collaborative work has been compounded by controversies within each field and the heterogeneity of the populations served. She claims that it can be too easy to place a deaf person with disability in a deaf education programme and hope that their strategies will be effective. Yet few disability specialists are competent signers.

While Roth criticises the lack of specialist assessments for this group, she also notes that teacher observation and referral is highly accurate. Case histories and informal assessments represent some of the best practice for learning disability. Research on educational programmes is also largely lacking, with a lack of tests with normative data available (Marschark & Spencer, 2003).

In the US, many special schools banned disabled deaf people so most were mainstreamed. In Sweden the two groups were also separated. Ewing and Jones argue that disabled deaf students need to be placed with their deaf peers because every child must learn linguistic competence to connect with the world. They echo the call for transdisciplinary approaches, sharing information across traditional disciplinary boundaries in a person-centred practice (Ewing & Jones, 2003).

From another perspective, many children attending bilingual programmes are only "semi-lingual" with minimal first language (e.g. refugees, migrants and multiply disabled) and they lack the metalinguistic skills to transfer these to a second language (Paterson, 2004). There is a danger that bilingual programmes will be seen as a "fix all" for students who do not succeed in oral programmes and will actually fix no one.

There is certainly a need for high-quality signing programmes that are not bilingual as such, but provide for a range of students, including students with disabilities and a range of communication modes (Paterson, 2004). Strict adherence to a particular approach does not best serve the needs of a growing number of students who have additional disabilities (Paterson, 2004).

15. Technology

The Swedish state agency for deaf and hard of hearing bemoans that so few people outside special schools and schools for the hearing impaired learn Sign Language. By training more Sign Language teachers and parents and by distance learning through internet and communication technology, this is expected to be redressed (Hendar, 2009).

Certainly there is great potential for using technology for the professional development of teachers, teaching and supporting of parents, as well as holding virtual classes in specific areas for children.

There is great potential for using technology for the professional development of teachers, teaching and supporting of parents, as well as holding virtual classes in specific areas for children.

Marschark et al (2006) concluded from a range of experiments in secondary and post-secondary settings that interpreting and real-time text have similar benefits in supporting students, and providing both services simultaneously does not appear to provide additional benefit.

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2. http://www.csdb.org/home and http://www.infanthearing.org/statematerials/diagnosed/CO_Colorado%20Home%20Intervention%20Program.pdf

3. www.dcal.ucl.ac.uk (university College of London, developing normative assessment tools)

4. http://www.batod.org.uk/index.php?id=/articles/guidelines/serviceorg.htm (British Association of Teachers of the Deaf web site)

5. http://www.handsandvoices.org/ (Hands and Voices, US)

Appendix 1

Sign Bilingual Education: Policy and Practice

Source: Swanwick R and Gregory S Sign Bilingual Education: Policy and Practice, UK, 2008

DEFINITION

A sign bilingual child is one who uses two or more languages in their daily life, at least one of which is a sign language.

Sign bilingual education is an approach to the education of deaf children which, in the UK, uses BSL and English.

PHILOSOPHY

The philosophy of the sign bilingual approach to education has its roots in a linguistic and cultural minority view of deafness and a social model of disability. It is based on recognition of the following:

- Equality of opportunity regardless of language, ethnicity, race, gender and disability.
- The value of diversity in society, including linguistic and cultural plurality.
- The language and culture of Deaf people.
- The goal of the removal of oppression and the empowerment of Deaf people.
- That deaf children have the same potential for language and learning as hearing children and the right to access to the knowledge, skills, and experiences available to hearing children, in an appropriate and relevant curriculum.

POLICY

- The terms used to describe deaf children reflect linguistic and cultural preferences.
- Deaf children are expected to achieve the same levels of educational attainment, social responsibility, employment and citizenship as their hearing counterparts.
- Decisions made about deaf children's education and educational requirements are based on their strengths and abilities, not on what they are perceived as being unable to do.
- Deaf pupils are potentially members of both the hearing society and the Deaf community.
- BSL has a significant role in the development and education of deaf pupils.

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