

Great expectations: Perspectives of cochlear implantation of deaf children in Norway

Eva Simonsen

Ann-Elise Kristoffersen

Mervyn B. Hyde

Oddvar Hjulstad

Address for correspondence:

Merv Hyde PhD

Centre for Applied Studies of Deafness

Faculty of Education

Griffith University 4711

Queensland Australia.

m.hyde@griffith.edu.au

+ 617 54482394

Abstract

This paper describes the impact of the use of cochlear implants with deaf children in Norway over the last 20 years and examines how this intervention has raised new expectations and some tensions concerning the future of education for deaf students. The paper reports on two national studies of communication within school learning environments and the educational experiences of young children with implants in Norwegian preschools and primary/elementary schools. These studies involved observations of classroom discourse and teaching activity and interviews with teachers, administrators, parents and pupils. Results suggested that there was a variety of patterns of use of Norwegian and of Norwegian Sign Language and several modes of communication including speech alone, sign alone and speech with sign. These varied according to local interpretations of national legislation for deaf children in district schools and programs for the deaf, the nature of the school placements, the use of available resources and teacher judgements about the needs of the children with a CI in specific classroom activities. Conclusions are drawn in relation to the future impact of cochlear implantation on the educational policies and services for deaf children and their families in Norway.

Great expectations:

Perspectives of cochlear implantation of deaf children in Norway

*People were overwhelmed with amazement. "He has done everything well," they said. "He even makes the deaf hear and the mute speak." Mark 7:37.*¹

Introduction

The use of cochlear implants with young deaf children has accelerated over recent years to a point where many children are fitted with single or bilateral implants in their first year of life (Hyde & Power 2006). This process has been considerably aided by the widespread implementation in most developed nations of programs of universal newborn hearing screening (Yoshinaga-Itano, 2003). These programs have the capacity to identify the nature and degree of hearing loss in the first few weeks after birth (Morton & Nance, 2006). Audiological and neurological processes follow diagnosis to ascertain the best possible candidates for implantation, with surgery taking place for many children with severe or profound hearing loss some time in the first year after diagnosis. Earlier diagnosis and implantation have had many major benefits reported (Yoshinaga-Itano, Sedey, Coulter, & Mehl, 1998; Yoshinaga-Itano, 2003; Fitzpatrick, Durieux-Smith, Eriks-Brophy, Olds, & Gaines, 2007) but also they have produced other outcomes that require major changes in the way in which deafness in young children is accommodated by policies and service systems, including those for education (Thoutenhoofd, 2006; Young, & Tattersall, 2007).

Of note is the need for families to deal with the diagnosis of their child's hearing loss at an earlier age, when there has typically been no previous suspicion of hearing loss. The important process of relationship building between parents and

¹ The Directorate for Health and Social Affairs, Norway (2006) *Cochlea-implantat (CI) – hjelp til et hørende liv.*[Cochlear implant (CI) – help for a hearing life]. p.1.

infant may be disturbed by the real or imagined consequences of a hearing loss for their child, for them or for their aspirations for their child. As Young and Tattersall (2007) suggest, early identification is of little value if it is not combined with services designed to assist families to utilize the potential time advantage that has been gained.

Much of the information that parents acquire about deafness, implantation and about conditions for a deaf child's development, is received directly from health or education professionals associated with the referral process after newborn hearing screening programs. Parents are placed in a situation where they are required to make early decisions about implantation and the ways in which to conduct their interactions with their child to form relationships and develop learning to enhance the child's opportunities for communication, socialisation and cognitive development.

As well as the contexts of individual families, there are the broader political, social, cultural and educational contexts in which decisions are taken and services are provided. Decisions about the child's development and future are made in dynamic personal, familial and emotional contexts that are embedded in the political and policy traditions in health, social development and education that a nation provides for its citizens. In this way, the processes of early identification of hearing loss, cochlear implantation and the nature of the responses of health and educational systems may be seen as part of an inclusive approach.

Most nations aim to support access by their citizens to equitable opportunities for development and learning through participation in their society. In education in particular, they provide policies and practices that are directed towards inclusive outcomes for all children. As Hyde (2009) noted, these policies and practices are not global but are grounded in societal values and tempered by the political cultural, social and historical traditions and resources of the nation concerned. Expectations

can therefore vary considerably regarding cochlear implantation of deaf children. In some nations the desired outcome may well be a form of equitable participation in daily life, development and learning processes in academic and social settings. In other countries the demand for excellence may also be a driving influence.

‘Excellence’ may be defined in these contexts as leading towards ‘oral perfection’ while ‘equitable participation’ may be less esteemed. Where both are present, simultaneously tensions can be evident among parents, professionals and within policy and service systems.

The Norwegian education system has ‘equity in education’ as a national goal and overriding principle (Norwegian Directorate for Education and Training, 2008). This implies that positive discrimination is required, leading to the claim that inclusive education means that the system must adapt to each individual and group. Adapted education as an educational principle, in turn focuses on the individual needs of each child. In line with current national policy, however, establishing satisfactory bilingual educational settings for individual deaf children within inclusive education settings in local schools remains a considerable challenge (Hyde, Ohna, & Hjulstad, 2006). Earlier classroom studies of learning environments for children in so-called inclusive settings in Norway reveal that students were often exposed to some exclusive communication practices (Ohna et al., 2003). In this study gaining access to a common communication and learning environment was dependent on the classroom structures and the pedagogical practices used by teachers, and in some cases interpreters, resulting in patterns of interaction that could either create constraints on communication or enhance the use of the classroom languages, and subsequent learning.

The present paper considers the situation of cochlear implantation of deaf children in Norway in these contexts.

The incidence of permanent hearing loss and the use of cochlear implants in children in Norway

Norway is a country of about 4.7 million inhabitants with its population spread across a significantly large geographical area. In Norway approximately, 0.1 % of newborn children have some form of hearing loss and several hospitals in Norway have commenced newborn hearing screening, with all hospitals participating in the newborn screening program from 2008

(<http://epos.stortinget.no/SpmDetalj.aspx?id=39796>). The incidence of permanent hearing loss is similar to rates observed in other developed countries (e.g., Mehl & Thomson, 2002), that is, typically one per 1000 with a permanent bilateral hearing loss of 40dB or greater. Of this group, at least 40% may be predicted to have a severe (30%) or profound (10%) sensory-neural hearing loss (Yoshinaga-Itano, Coulter & Thomson, 2000, Johnston, 2004), including those with detected or undetected retro-cochlear complications. This group comprises the most likely candidates for cochlear implantation.

It is anticipated that the full implementation of universal newborn hearing screening (UNHS) in Norway will significantly lower the age of diagnosis of hearing loss and increase the potential for earlier fitting of hearing aids or implants and the commencement of forms of parent/family support at earlier stages. In other countries that have implemented UNHS, age of confirmed diagnosis has been reduced from an average of 24-30 months to two to three months (Morton & Nance, 2006, Young &

Tattersall, 2007). With the implementation of UNHS in Norway there is already evidence of an earlier detection process unfolding with four children implanted under 12 months of age in 2005 and 15 between one and two years of age in the same year and by 2007 17 infants had been implanted under 12 months and 46 under two years of age (Table 1 shows implantation data by year).

The use of cochlear implantation for persons with a hearing loss in Norway also reflects the process in other developed countries. The first person to receive a cochlear implant in Norway was an adult fitted in Trondheim in 1985 and from 1985 - 1989, 19 other adults received an implant. The first postlingually deaf child was implanted in 1988 at 6.5 years of age at the Rikshospitalet (The National University Hospital) in Oslo. This was believed to be the first child implanted in Europe with the Nucleus 22 prosthesis. The following year, the first prelingually deaf child was implanted at eight years of age. Subsequently, the child did not benefit from the implant and became a non-user. In 1992, a three year-old, prelingual deaf child was implanted and educated in a bilingual program, as was the standard practice at the time. The child is still a consistent user of the device. To date, the youngest child implanted in Norway was aged five and a half months.

Between March 1988 and December 2006, more than 300 children were implanted and by December 2007 364 children had received an implant. Unlike some countries, all implant surgery on children is conducted at one hospital, the Rikshospitalet in Oslo. Other hospitals in Norway, in Bergen and Trondheim, perform implantations, but only on adults. Children with a hearing loss are assessed at the Rikshospitalet with implantation including severely as well as profoundly impaired children and some children with additional disabilities. Bilateral implantation is available if considered anatomically and audiologically feasible.

Parents have a choice of both MED-EL and Nucleus devices. The process of implantation (including assessments, surgical procedures, prosthesis costs and post-implant mapping and therapy) involves no cost for parents.

Table 1 Child cochlear implantation from 1988 to 2007

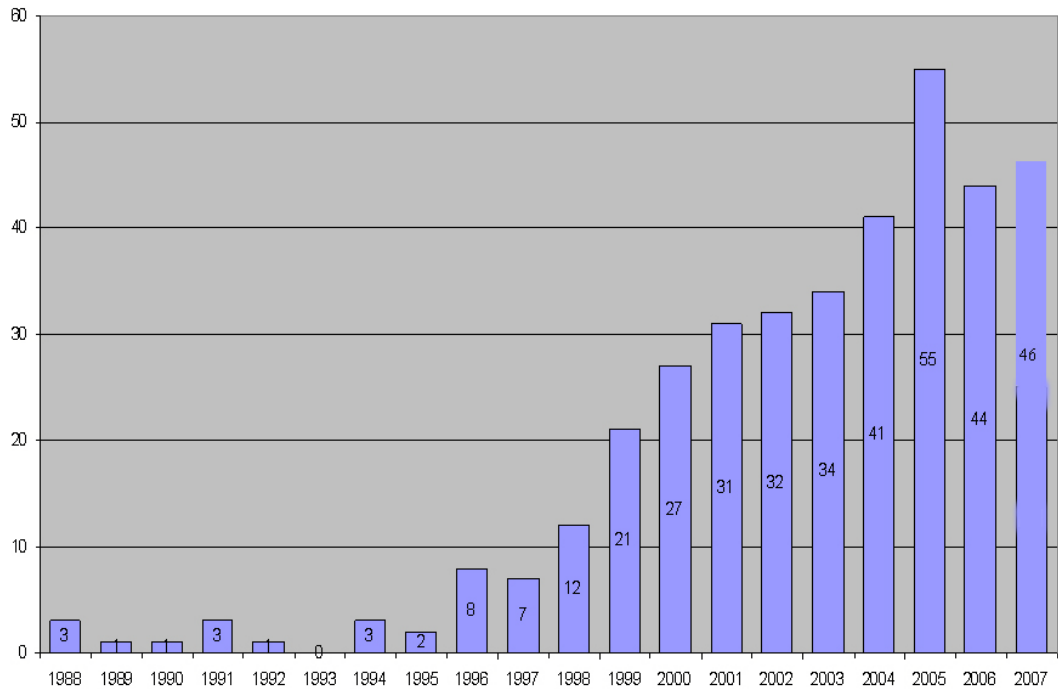


Table 1 shows a slowly increasing pattern of child fittings from 1988 to 1998, with acceleration beyond 1999. The 2003 and 2004 (reported in January 2005) annual data reflect little change in the ages of fitting with 33 percent of children being implanted between 2-3 years in 2004, 35 percent in 2003 and in 2006-7 a majority was fitted under one year. As indicated, the national implementation of UNHS continues to influence this pattern towards younger ages of fitting.

The education system for deaf children and their families in Norway

In Norway, the French pedagogical system for educating deaf children was imported through Denmark near the start of the 19th century. In 1825 the first school for the deaf, based on the use of sign language, employing both deaf and hearing teachers, was established in Trondheim in central Norway. Some years later the ‘German method’ based on oral training was introduced at a new private school for the deaf in the capital of Norway, Christiania (later Oslo) in 1848. The well-known rivalry between manual and the oral educational methods took its specific turn in Norway after 1850. Both the manual and the oral schools were seen as being successful, leading to some satisfaction but also further aspirations among politicians, the public and professionals. In consequence, Norwegian authorities in 1881 launched specific, ambitious and progressive legislation concerning education for all deaf children (Lov om abnorme Børns Undervisning, 1881). Embedded in this legislation was the conviction that the ‘abnormality’ of deaf children or deaf people primarily was related to the exceptional educational methods required in their development and education.

According to the 1881 Abnormskolelov (legislation concerning the education of abnormal children), both the manual and oral communication methods were to be applied in schools, with the restriction that each school was not to use more than one method (Simonsen, 2000). The transition of the system of schools for the deaf in Norway through the 19th and 20th centuries can be characterised as following international trends, with severe limitations on the use of manual methods and sign language following the Milan Congress of 1880 and the ‘new’ rise of oralism following the influence of the Ewings (Ewing & Ewing, 1954, 1958, 1964) and Huizinga's "acoupedics" in Holland (Power & Hyde, 1997). This remained the

situation until the decade between 1970 and 1980, during which national legislation and policy was reformed (Simonsen, 2005).

Following this period, optimism developed regarding the value of bilingual education of deaf children and efforts to develop specific curricula adjusted to the needs of deaf children followed. By the end of the 1990's bilingual education and the schools for the deaf using this approach were flourishing, supported by legal protection of the children' rights to access bilingual education using Norwegian Sign Language (NSL) (Opplæringsloven, 1998: § 2.6). An increasing number of deaf children received their education split between their local school and a school for the deaf. A free, 40-week educational program for teaching parents and families basic sign language and knowledge about deafness has been offered since 1995 ("Se mitt språk" ['See my language']). The political, legislative and educational structures used in Norway for deaf children and their families are different from those in other countries and even have specific differences from the systems used in other Nordic countries.

A national state support system for children with special educational needs was established in 1992, with its main objective being to assist families, local schools and municipal authorities in their efforts towards inclusion of children with special needs in local schools. The national support system consists of 15 resource centres funded by the state and 25 associated centres funded by independent or other means. Among these are six resource centres for deaf and hard-of-hearing children, each with a school for the deaf and itinerant advisory services. These centres offer supervision and guidance for individual children and their families as well as programs for municipalities, local schools and child guidance services. One of the centres, the Skådalen Resource Centre, has a specific research unit. Both the Skådalen Centre and

some of the other centres conduct research on deaf education in close collaboration with universities in Norway and abroad, with the intention of monitoring the national system of education for deaf pupils and promoting effective change. The research reported in this paper is such an outcome.

During the last decade two principal discourses about the education of deaf children with cochlear implants have emerged in Norway, as they have in many other Western countries. These two discourses, a cultural-bilingual discourse and a medical-cochlear implant discourse, leave limited scope for an arguably more salient discourse on distinct educational issues (Simonsen & Ohna, 2003). The assumed dichotomy between these two reigning discourses leaves education in a somewhat restricted position at a critical time when issues of pedagogy and curriculum should be primary focii for researchers and practitioners (Hyde & Høie, 2007).

According to Sections 2-6 of the Norwegian Education Act of 1998 parents may decide whether or not their deaf child should be in a program of bilingual education with Norwegian Sign Language (NSL) added as a language for instruction and communication. Specific syllabi for educating these pupils were developed during the 1990s. As such, Section 2-6 may be implemented in special classes or in local schools across the districts of Norway.

In 2008 paragraph 2-6 in the Educational Act was revised. In this revision a strictly defined bilingual educational program is no longer required in order to gain access to sign language in their education. Any child with an educational need to learn and be taught through sign language will be entitled to that, regardless of the categorisation of their educational program or school.

The choice of educational approach, communication mode and the language/s used are dependent on the parents' judgements about the educational needs of their

child and particularly their wishes in relation to the preferred modes of communication applied in classrooms. Their decision is usually made in a context of counselling and support by an interdisciplinary professional team. What is unusual in an international context is that right to bilingual education for a deaf child is not dependent on audiological criteria, but on the assessment of communicative and educational needs. It remains to be seen how long this present context of decision-making based on communicative and educational evaluations will last.

The new potentials, both real and perceived, presented by the earlier detection of hearing loss and the impact of greater levels of implantation of severely and profoundly deaf infants are creating challenges to current educational policies and practices directed at achieving inclusion in a context of bilingualism and there are tensions evident among practitioners, parents and associations of deaf and hard-of-hearing people. Using two national projects conducted over the last decade by the Skådalen Resource Centre as focus, this paper will attempt to update the situation of Norway in respect to the implications of cochlear implantation for policy and practice.

Research on inclusive education of children with cochlear implants in Norway

The first study 'Children with cochlear implants' (conducted 1999-2001) examined the communication conditions in the learning environments of 43 deaf children in kindergartens and primary schools and upper secondary schools (Landsvik 2001; Christophersen, 2001; Strand, 2002; Hjulstad, Kristoffersen, & Simonsen, 2002, Simonsen & Kristoffersen 2001). The children in kindergartens varied in age from three to five years and six months. The age at which the children received their implants varied from two years and six months to five years and one month, with an

average age of implantation of three years and two months. According to parental reports and school records 20 children were considered (information provided by parents) as prelingually deaf and four as postlingually deaf. The 19 pupils attending school varied in age between six and 19 years.

This qualitative study included interviews with children with cochlear implants, their parents and teachers, and videotapes of interaction patterns in classrooms and kindergartens as well as related field notes. Analyses of the recordings of children's access to classroom communication showed major variations among the kindergartens, schools, programs and professionals participating in the study (Hjulstad, Kristoffersen, & Simonsen, 2002). Assessment of interaction and participation patterns demonstrated correspondence with the modes of communication applied in the sense that educational settings that offered a range of cultural tools, including both sign language and spoken language and an array of flexible and adapted approaches to communication, represented beneficial environments in relation to higher levels of pupils' participation and inclusion in classroom activities (Hjulstad, Kristoffersen, Simonsen 2002). In educational settings using spoken Norwegian, access to communication and interaction was restricted in many cases, including collective learning processes in groups and participating in classroom instruction and associated peer interaction. Parents' responses demonstrated expectations more in line with their children achieving an appropriate level of 'participation', primarily in school and family life, rather than expectations of 'excellence', particularly with the use of spoken language (Strand, 2002). As for the children themselves, the nine primary school children who were interviewed were able to convey an impressive meta-comprehension of their communicative situation and the strategies they used to participate (Christoffersen, 2001).

The second study of educational settings for children with cochlear implants, ‘Inclusive education of children with cochlear implants – a follow-up study’, was undertaken from 2004-2007. This was a study of the same 24 children with cochlear implants in kindergarten included in the study described above (‘Children with cochlear implants, 1999-2001’). These former preschool children were tracked in their lower primary school settings (Simonsen, Kristoffersen, & Hjulstad, 2008). A majority of the 24 children was placed in their local schools, while some were placed in special units or special schools for the deaf. School placement, however, is not representative of educational program in Norway, as bilingual programs can be identified in all these settings. However, programs using spoken Norwegian as the single communicative tool are only to be found in local schools. The main purpose of the follow-up study was to generate knowledge from the educational practices that were observed and reported. The research questions were:

- What kind of linguistic resources are available and in use in the interactions between teachers and children in the activities in classrooms?
- What are the opportunities and constraints for learning and participation within different educational practices observed?
- How do schools regard the learning environment for deaf pupils with a cochlear implant?

Sample description and procedures

The children in this study are now generally regarded as the cochlear implant ‘pioneers’, implanted in the period 1996-1999, and they represent about 70% of the total population (35) of preschool children implanted before 1999. The project

included 10 girls and 14 boys from both rural and urban areas in Norway. In addition to the diversity within the group in terms of age, school type, education program, degree of hearing loss, and curriculum category chosen, there was also considerable diversity with respect to how classroom communication and participation were organized, regulated, and maintained. This involved variations among the modalities (speech, sign and speech with sign) that were used and also two languages in use: Norwegian and NSL.

Data were collected during the 2004-2005 school years. The children were then aged from seven years to 11 years, attended school grade levels 1-5, and length of implant use varied from five to eight years. The educational placements of the pupils included: local schools (15), schools for deaf and hard-of-hearing (7), and local schools with separate units for deaf children (2). The curriculum categories chosen by parents were: bilingual education (Section 2.6 of the Education Act; 18), special needs education (Section 5.1 of the Education Act), and local schools using only spoken Norwegian. Some findings from the initial study and the follow-up study are reported here to demonstrate the patterns of communication and language use that emerged.

The data from both the initial study (1999-2001) and the follow-up study (2004-2007) consist of field notes of classroom activities and interactions, the products of children' activities (mostly written materials) and of classroom organisation and teaching materials. The observations were based on multiple audiovisual recordings of different forms of classroom talk and the interactive events and contexts in which they occurred. Two cameras on tripods were used with an external microphone. Transcriptions were made of the recorded classroom activities, noting lesson or activity type, the participants involved, the classroom organisations,

the nature of the discourses occurring and the communication modes and language forms used. Interviews with teachers and principals were audio-recorded and transcribed. The audiovisual data consisted of approximately 60 hours of recordings, and the audio-taped interviews totalled approximately 50 hours. Additionally, we scored the *Category of Auditory Performance (CAP)* and *The Speech Intelligibility Rating (SIR)* for each student (O'Donoghue et al., 2000). These data are presented in Tables 2 and 3

Table 2 Category of Auditory Perception

Categories of auditory perception (CAP)	Kindergarten			School
	12 month	24 month	36 month	6-8 year
7 Use telephone, familiar speaker	1	1	2	11
6 Understand conversation				2
5 Understand common phrases	1	2	1	7
4 Discriminate speech sounds	12			4
3 Recognise environ sounds	1			
2 Respond speech sounds				
1 Aware environmental sounds	3			
0 No awareness of sound				
Total	18	3	3	24

Table 3 The Speech Intelligibility Rating

Speech Intelligibility Rating (SIR)	Kindergarten			School
	12 month	24 month	36 month	6-8 year
5 Intelligible to all	1			10
4 Intelligible to listeners with little experience			1	9
3 Intelligible to experienced listeners	2	1	1	4
2 Unintelligible	12	2	1	
1 Sign language	3			1
0 Preverbal				
Total	18	3	3	24

These tables show increasing rates of auditory perception and speech intelligibility for most of the children across the study period.

Some characteristics of the use of modalities in classrooms

This second study involved two methods and related analyses. The first involved an examination of interaction patterns based on a conversation analysis focussed on understanding the nature of situated learning in local school and special classrooms in which the deaf pupils with a CI were enrolled (Hjulstad & Kristoffersen, 2007, Hjulstad, in press). The second method involved interpretations of the statements of the experiences, pedagogical principles and practices reported by education staff, including teachers, sign language interpreters, teacher assistants and principals (Simonsen, Kristoffersen, Hjulstad, 2008).

To describe a 'typical' classroom in our study is complex. When categorizing the classrooms according to their use of a particular communication modality during classroom activities, five different patterns were identified, (Table 4).

(Table 4 here)

While these patterns were not used in all activities in the particular schools involved, they do offer evidence of the diversity of ways in which communication and language issues were operating. There was no common causal explanation and the observed diversity is seen to be an outcome of the various interpretations that are possible under national legislation and policy concerning deaf children, the choices that parents, schools and teachers make and the devolution of many of these decisions to local school districts serving the needs of deaf children within their existing

resource base. Thus there may be considerable diversity within schools despite their being an apparent use of a particular pattern of communication at any specific time.

Any expectations that classroom practices would be in accordance with the conventional labels assigned to the education of deaf students were not found in these studies. On the contrary, the analyses show that local classroom practices with local and pedagogical adjustments to the perceived needs of individual children were the pattern. In this Norwegian context, the notion of fixed educational programs in conventional terms of 'oral education', 'bilingual education' or 'total communication' makes little sense. This finding suggests that other national or comparative studies of the classroom experiences of deaf students with a CI may prove productive in revealing what diversity exists among the communication and curricular practices used in schools and associated local interpretations of national policies (see also Knorrs, 2007).

Educational or instructional patterns

In examining the local schools, in which there is usually only one deaf pupil with a CI in a class of hearing children, our findings indicate that some teachers' choices of communication mode and language were guided by their perspective that all children should be able to participate in the classroom discourse. Other teachers, however, seemed to be lead more by directions from medical advisers or by parents about which communication mode to apply. Here, differences between mixed-modality classrooms may, to some extent, be influenced by the child's degree of hearing loss and perceived competence in a particular language. An interesting and perhaps more important finding is that different instructional activities appear to

create different challenges with respect to participation by the child with a CI, but the availability of different communication modalities offers potential for enhanced participation. For example, the use of sign and speech at the same time is more common in teacher-directed plenary lessons where the teacher is bilingual and addresses both the bilingual deaf pupil and the hearing pupils at the same time.

Whole-class conversation was less teacher-directed and all children were communicatively more active. This often created a more demanding discourse for children with a CI, and the teachers more frequently used sign and speech at the same time in their contributions, and interpreted peers' speech-alone contributions into sign-alone form for the deaf pupil. We termed this kind of mode and language mixing 'participation-related modality alternation'. Other kinds of activity were less participant-demanding for the child with a CI, for example, seat work, when teachers often used speech alone in communication. Even here, teachers mixed languages and modes in different ways in different situations, for example, during the explanation of certain concepts, clarifications, or other situational aspects in a specific context.

In the study sites there were also instructional activities that were interpreter-mediated, rather than teacher-mediated and also classes in which most hearing pupils were reasonably proficient in NSL. These further demonstrated the variety of communication modes and mixing of the language forms used according to the perceived needs of the child with a CI, the participants involved and the activity in question.

We observed in the bilingual classrooms (those where parents had chosen to adopt Section 2-6 of the Education Act and its provisions) that the goals and purposes of the teaching of children with a CI were not necessarily about maintaining NSL as their first language, as it was quite possible that the language learned first was no

longer the pupil's most frequently used language at school or at home. This was true for many of the children in our study where the use of Norwegian in spoken and written forms remained in active use in classrooms.

Teacher statements

The findings reported here do not constitute the entire set of findings from the two studies (Hjulstad, Kristoffersen, & Simonsen, 2002, Simonsen, Kristoffersen, & Hjulstad, 2008) but are presented here to demonstrate the contextualising influences of national legislation and policy, local school practices, teacher knowledge and parental choices about the educational experiences of children with a cochlear implant.

The teachers generally reported a pragmatic approach to the use of linguistic forms in the classroom. Choices were made based upon the nature of the learning situation and the relational aspects involved. The legal framework of the education of each pupil, whether it was bilingual education according to § 2-6, special needs education according to § 5-1 or simply ordinary adjusted education, was not a precise indicator of the actual educational practices of any classroom, as noted earlier in this paper. This outcome was explained by teachers as result of practicalities such as access to specific language competencies and resources, associated economic resources and also as a consequence of the pedagogical freedom and sovereignty of the local school and the individual teacher.

The educational practices reported by the teachers in the follow-up study seem to indicate two different profiles among the teachers, reflecting their professional position in regard to the children with CI; a sense of independency or of dependency. The first group reported that they encouraged the children to speak and

communicate in whichever language and mode was most functional and could be comprehended by the participants in the particular activity. None of these teachers were dissatisfied if the children with a CI used, for example, speech more than sign or sign more than speech. This was simply regarded as part of the process of becoming capable of participating and communicating within different communities of language users and a consequence of being a bimodal, bilingual learner. Further, it did not necessarily suggest a primacy for either language or indeed the child's progression towards becoming a more monolingual, spoken language user. These teachers viewed the emerging bimodal bilingualism as a characteristic among these young cochlear implant pioneers, many of whom were introduced to sign language before receiving their implants.

The other kind of professional position recorded among the teachers in this study may be identified as being more dependent on external authorities in regard to their responsibilities towards the child with a cochlear implant. These teachers reported strong external influences and expectations at work including: parents, educational -psychological services, resource centres and the cochlear implant team at the national hospital. While these external agents may agree, often they do not, placing these teachers in a difficult position.

The main disagreement reported was over the language mode to be applied in the school. When both visual and auditory languages were allowed, the tension levels were reported as being low and allowing for diversity in instruction and adapted education. In the cases where spoken Norwegian was the only language permitted tension levels were reported to be higher. Some of these teachers describe how they felt squeezed between expectations and reality; and had difficulty in meeting the demands of their classrooms: 'We try not to use sign language in class – but it is hard'.

Or: 'I realize when he does not understand what is being said. Then we have to use our hands.' The increasing complexity of the subjects taught in primary and secondary schools, the demand for higher levels of literacy and thus increasing problems in providing access to communication in classrooms was creating anxiety for several of these teachers.

The gap reported by these teachers between government, parental and societal expectations of cochlear implantations and their perceived realities of the education of these children may be interpreted as a problem of bridging bilingualism, special needs education and adjusted education as legal and political terms in Norway to the complex and diverse communicative and educational needs of deaf children with an implant. An outcome of the study may be said to be the strong conviction among teacher participants about the need for more studies of the use of CIs in various school and classroom contexts that may reveal the complexities of communication patterns and language mixing across a range of curricular activities. In this way effective communication may enhance participation as a part of the learning processes of the classroom and not be viewed as an end in itself.

Conclusion

Norway is a country with a relatively small population but strong historical and social traditions directed towards national independence and inclusion of all its citizens in education. The trends noted for the early detection and incidence of hearing loss among young children and the early use of cochlear implants, largely parallel those observed in other developed nations. An exception, to date, has been that the child's degree of hearing loss has not been a critical factor in the determination of school placement, the right to bilingualism or curriculum choice.

What is demonstrated in the findings reported here and in the description of the Norwegian system for the education of deaf children is that specific national legislation, local responses to policy implementation, traditions about the recognition of languages and the use of teacher judgements in classrooms can significantly influence the everyday experiences of deaf children with cochlear implants. In particular, there is revealed a diversity of communication practices and outcomes that may be seen as participatory and inclusive in the settings and learning contexts involved. In terms of communication, these involve the use of spoken Norwegian and NSL as well as the discriminating use of various forms of language and modality mixing in learning activities in classrooms.

Although Norway has strong and well-articulated legislation, traditions and policies in the area of bilingualism for deaf children in inclusive education contexts, these contexts are now being challenged and pressures for reform of service systems are evident. There are tensions and pressures associated with changing expectations by some parents and professional and community groups about the implications of earlier detection of hearing loss through UNHS and earlier cochlear implementation of deaf children. These major changes and the opportunities that they present are placing current policies and practices in a critical perspective. Expectations by some parents and professionals of outcomes that are not clearly associated with the children's development of bilingual competence and identity are a present source of tension and debate among stakeholders.

While the early detection of hearing loss and implantation of younger deaf children are of major significance and benefit for all concerned, the need to consider the diverse outcomes that these developments may have for individual children in classrooms across the country and in their post-school life remains paramount. In this

context, the experiences reported with cochlear implants in Norway may be described as complex, but not necessarily confusing. Many teachers of these deaf pupils seem to be able to focus on classroom learning, using a variety of tools of communication and learning. This makes the flexibility that is available in the current legislation and policy a major asset of that system.

In any reformation of policy and practice it is essential that the perspectives of teachers, the pedagogies they use and the realities they face continue to be a focus in studies of learning by deaf children in classrooms. Teachers and other practitioners of the classroom represent a unique source of knowledge for research on the educational needs of children with cochlear implants (Thoutenhoofd et al., 2005). In particular, there is an urgent need for school achievement data of students with an implant using, for example, some of the methods used in the study of the educational achievements of deaf pupils in Scotland by Thoutenhoofd (2007). Tapping this pool of knowledge and combining quantitative data on demography and large scale educational attainment data with ethnographic approaches and classroom studies on a micro level may lead to increased understanding and reveal the subtleties and complexities involved in cochlear implantation in early childhood and in education. The object of such research would be the intrinsic and dynamic ways deaf pupils make use of languages for interaction with their environment in the learning processes.

What the current situation in Norway, as exemplified by the two studies reported above, seems to imply is the possibility of a unified rather than a dualistic or divided perspective on the national future deaf education, provided that both visual and auditory modes of communication and the languages that they may form are perceived not as oppositional but as complementary. In this sense 'excellence' as noted in the introduction to this paper would be a marker of the quality of the learning

environment and an indicator of degree of access to communication for all students, not as a reference to any single language form or communication mode.

Author affiliations

Eva Simonsen is Director of the Department for Research and Development at Skådalen Resource Centre, Oslo, and Professor II in the Department for Special Needs Education, University of Oslo, Norway.

Ann Elise Kristoffersen is Research Fellow at Department for Research and Development at the Skådalen Resource Centre, Oslo, Norway.

Mervyn B. Hyde is Professor and Director of the Centre for Applied Studies of Deafness at Griffith University, and Adjunct Professor at the University of the Sunshine Coast, Australia and Research Consultant at Skådalen Resource Centre, Oslo, Norway.

Oddvar Hjulstad is a researcher at Skådalen Resource Centre and a PhD candidate at the Department for Special Needs Education, University of Oslo, Norway.

References

- Christoffersen, A-B. (2001). Barn med cochlea implantat – hvordan opplever de sin kommunikasjonsituasjon? [Children with cochlear implants – their communicative strategies and experiences]. Oslo: *Skådalen Publication Series No 11*.
- Ewing, I. R., & Ewing, A. W. G. (1954). *Speech and the Deaf Child*. Manchester: Manchester University Press.
- Ewing, I.R., & Ewing, A. W. (1958). *New Opportunities for Deaf Children* London: University of London.
- Ewing, A. G. W., & Ewing, E. C. (1964). *Teaching Deaf Children to Talk* Washington DC: Volta Bureau.
- Fitzpatrick, E., Durieux-Smith, A., Eriks-Brophy, A., Olds, J., & Gaines, R. (2007). The impact of newborn hearing screening on communication development, *Journal of Medical Screening*, 14, 3, 123-131.
- Hjulstad, O, Kristoffersen, A-L, & Simonsen, E. (2002). Barn med cochlea implantat. Kommunikative praksiser i barnehagen. [Children with cochlear implants. Communication practices in kindergartens]. Oslo: *Skådalen Publication Series No 17*.
- Hjulstad, O., & Kristoffersen, A-E. (2007). Pupils with a cochlear implant in Norway:

Perspectives on learning and participation in research and practice. In Hyde, M. & Hoie, G. (Eds.) *To be or to become: Language and learning in the lives of young deaf children*. Oslo: *Skådalen Publication Series No 25*.

Hyde, M. B. (2009, in press). Inclusion in international context. In D. Moores, and M. Miller Eds.) *Deafness around the World: Developmental, Educational, and Cultural Issues*. Washington DC: Gallaudet University Press.

Hyde, M. B. & Høie, G. (2007). (Eds.) *Constructing Educational Discourses on Deafness*. Oslo: *Skådalen Publication Series No 26*.

Hyde, M.B., Ohna, S-E. & Hjulstad, O. (2006). A comparison of the definitions, policies and practices associated with the educational inclusion of deaf students in Australia and Norway, *American Annals of the Deaf*, 150, 5, 415-426.

Hyde, M.B. & Power, D. (2006). Some Ethical Dimensions of Cochlear Implantation for Deaf Students and their Families, *Journal of Deaf Studies and Deaf Education*, 11, 102-111.

Knorrs, H. (2007). Educational Responses to Varying Objectives of Parents of Deaf Children: A Dutch Perspective. *Journal of Deaf Studies and Deaf Education* 12, 243-253.

Landsvik, B. (2001). Barn med cochlea implantat- kommunikasjon og samspill i barnehagen. [Children with cochlear implants – communication and interaction in kindergarten]. Oslo: *Skådalen Publication Series No 12*.

Morton, C. C., & Nance, W. E., (2006). Newborn hearing screening: A silent revolution. *The New England journal of Medicine*, 354, 2151-2164.

O'Donoghue, G.M., Nikolopoulos, T.P., & Archbold, S. (2000). Determinants of speech perception in children after cochlear implantation. *The Lancet*, 356, 9228, 466-468.

Ohna, S-E, Hjulstad, O., Vonen, A.M, Grønlie, S., Hjelmervik, E., & Høie, G. (2003). På vei mot en ny grunnskoleopplæring for døve elever [Towards a new primary education for deaf students]. Oslo: *Skådalen Publication Series No 20*.

Power, D. J., & Hyde, M. B. (1997). Multisensory and unisensory approaches to communicating with deaf children. *European Journal of Psychology and Education*, 12, 449-464.

‘See my language’

http://www.statped.no/moduler/templates/Module_Article.aspx?id=27929&slanguage=NO).

Simonsen, E. (2000). *Vitenskap og profesjonskamp: Opplæring av døve og åndssvake i Norge 1881-1963*. [Science and professional struggle: Education of the deaf and of the mentally retarded in Norway 1881-1963. Not available in English]. Oslo: Unipub.

Simonsen, E., & Kristoffersen, A-L. (2001). Barn med cochlea implantat- en kunnskapsstatus [Children with cochlear implants - state of the art]. Oslo: Skådalen Publication Series No 13.

Simonsen, E., & Ohna S.E. (2003). *Behovet for kvalitetsreform i audiopedagogikken*. [The need for reform in teacher training for education of the deaf. Not available in English] *Spesialpedagogikk*, 68, 1, 14-21.

Simonsen, E. (2005). Disability History in Scandinavia: Part of an International Research Field. *Scandinavian Journal of Disability Research*, 7, 3-4, 137-154.

Simonsen, E., Kristoffersen, A-L., & Hjulstad, O. (2008). Inkluderende opplæring av barn med cochleaimplantat – en oppfølgingsstudie [Inclusive education of children with cochlear implants - a follow-up study]'. Oslo: Skådalen Publication Series No 27.

Skådalen Publication Series (1996 –2008). See: www.skadalen.no (DELETE?
SEEMS TO BE ABOVE IN EACH CASE?)

Strand, L. (2001). Å høre til: Samtaler med foreldre. [Belonging: Talks with parents].
Skådalen Publication Series No 19.

Thoutenhoofd, E. (2006). Cochlear implanted children in Scottish schools: 4-year school attainment data (2000-2004). *The Journal of Deaf Studies and Deaf Education, 11, 2*, 171-188.

Yoshinaga-Itano, C., Sedey, A.L., Coulter, D.K., & Mehl, A.L. (1998). The language of early- and later-identified children with hearing loss, *Pediatrics, 102*, 1161-1171.

Yoshinaga-Itano, C. (2003). From screening to early identification and intervention: Discovering predictors of successful outcomes for children with significant hearing loss. *Journal of Deaf Studies and Deaf Education, 8, 1*, 11-30.

Yoshinaga-Itano, C. (2004). Earlier identification for earlier intervention. In D. Power & Gregory R. Leigh (Eds.), *Educating deaf students: Global perspectives* (pp. 69–84). Washington, DC: Gallaudet University Press.

Young, A., & Tattersall, H. (2007). Universal Newborn Hearing Screening and Early Identification of Deafness: Parents' Responses to Knowing Early and Their Expectations of Child Communication Development, *Journal of Deaf Studies and Deaf Education, 12, 2*, 209 – 220.

Table 4 Patterns of language and modality use in classrooms

	Mixed-modality classrooms		Separate-modality and unimodal classrooms		
Characteristics of use of language modality in the classroom	Regular systematic use of speech alone, simultaneous sign and speech and sign alone. Some lessons in local schools are interpreter-mediated, depending on the type activity.	Regular systematic use of speech alone and simultaneous sign and speech. Sign alone rarely used in the classroom. For pupils attending a bilingual program, sign alone is used in sign language lessons.	Sign alone. Simultaneous sign and speech and speech alone rarely occur in the classroom, but in separate classes. In local schools, lessons may be interpreter-mediated.	Speech alone Simultaneous sign and speech and sign alone used in separate classes.	Speech alone
Types of school	Local school/ School for deaf and HoH	Local school	Local school/ School for deaf and HoH	Local school	Local school
Curriculum categories	Bilingual (§ 2-6) Special Needs Education (§ 5-1)	Bilingual (§ 2-6) Special Needs Education (§ 5-1)	Bilingual (§ 2-6)	Bilingual (§ 2-6)	Special Needs Education (§ 5-1) Local school using spoken Norwegian