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Inclusion in Postsecondary Institutions With Small Numbers of Deaf and Hard-of-Hearing Students: Highlights and Challenges

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This paper provides an examination of how small populations of deaf and hard-of-hearing (DHH) students attending New Zealand postsecondary institutions faced and dealt with various challenges in participating in classes, obtaining adequate access to services, and becoming socially integrated into campus life. Sixty-four students completed a survey and 8 were interviewed, providing information about their support needs, learning, and social participation experiences and challenges within the postsecondary context. Findings indicated that access to accommodations that facilitated communication and inclusion were critically important to their learning and participation experiences but were not always available in the institutions they attended. Reflecting recent policy and legislative changes, greater awareness and greater funding support are needed within New Zealand postsecondary institutions of DHH students' academic and social needs. This process should be at the forefront of moves toward inclusive education at the postsecondary level, if DHH students are to be equal participants.

The importance of gaining a postsecondary education has never been greater. Education beyond the secondary school level is crucial to people's ability to enter and successfully participate in the increasingly complex work environment of today. The number of students accessing postsecondary education in New Zealand has increased steadily over recent years, including deaf

students, who are now entering postsecondary education in greater numbers than ever before. Ascertaining the actual number of deaf and hard-of-hearing (DHH) students in postsecondary institutions in New Zealand is difficult. There are no official figures available, but in 2007, based on information postsecondary institutions' disability coordinators returned as part of the required reporting to the Tertiary Education Commission, there were approximately 800 enrolled DHH students registered with the institutions' disability support services. Most institutions reported fewer than 10 Deaf and 20 hard-of-hearing students (personal communications from Disability Support Officers in postsecondary institutions, 2013).

In New Zealand, postsecondary education includes universities that historically focused on academic programs and polytechnics that traditionally focused on practical vocational training. Over recent years, polytechnics have added degree programs to their course offerings and there is now a significant overlap between universities and polytechnics. Specialist support services for the few DHH students enrolled in any particular institution are not provided. Instead, each institution's generic disability support offices attempt to assess DHH student needs and provide a range of resources.

Findings of previous research examining the experiences of DHH students have pointed to the

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difficulties these students faced when transitioning to, and participating in, postsecondary education. Students in the United States, United Kingdom, and Australia have encountered a range of barriers to their learning and participation, including functional, environmental, and attitudinal barriers to classroom participation; accessing the curriculum in an equitable way; and a reduced sense of academic and social inclusion (Barnes, 2006; Carter & Silver, 2006; Convertino, Marschark, Sapere, Sarchet, & Zupan, 2009; De Filippo, 2004; Foster, Long, & Snell, 1999; Hyde, Punch, Power, Hartley, Neale, & Brennan, 2009; Jambor & Elliot, 2005; Richardson, 2007; Richardson, Marschark, Sarchet, & Sapere, 2010; Stinson & Walter, 1997; Traynor & Harrington, 2003). Accommodations that assisted their learning and persistence in postsecondary education included the provision of support services, such as note-takers and interpreters, but this did not necessarily “level the playing field” for these students, or effectively address their social needs.

The small number of studies available in New Zealand generally reflects these findings regarding the conditions necessary to support the inclusion and participation of DHH students in postsecondary education (Carr, 1994; Crabb, 1999; Logan, 1995; Murray, 1994; Sameshima, 1999). Despite this, the New Zealand education sector has only recently shown limited commitment in policy and in funding to provide the resources needed to support equitable outcomes for DHH students in the postsecondary sector.

The goal of educational inclusion, according to Stainback, Stainback, East, and Sapon-Shevin (1994) is “not to erase differences, but to enable all students to belong within an educational community that validates and values their individuality” (p. 489). At the international level of human rights, New Zealand has signed the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD; ratified by New Zealand in 2008; United Nations, 2008), and among other obligations, this Convention requires New Zealand to promote access, inclusion, empowerment, equality, and the right to education. At the national level, New Zealand does not have any specific antidiscrimination laws; therefore, tertiary institutions’ legislative obligations to address the needs of

students with disability, including DHH students, fall under the Human Rights Act 1993 and the Education Amendment Act 1990.

In order to meet these obligations, the compulsory education sector (school years 1–13) provides DHH students with access to the services of resource teachers of the deaf (RTD), advisors of the deaf (AODC), teacher aides, New Zealand Sign Language (NZSL) support, and specific support funding. DHH children also have the right to assistive auditory devices, such as FM systems and hearing aids provided by the government, until the age of 21.

New Zealand’s compulsory education statistics show that an estimated 95% of DHH students now attend regular classes with varying levels of support. Their communication mode is primarily oral–aural with use of amplified residual hearing and speech reading. The remaining 5% of children are based in one of two separate schools for the deaf (Deaf Education Aotearoa New Zealand, 2005). Children at these schools have greater access to NZSL as their main mode of communication (McKee & Smith, 2004; WEBResearch, 2003).

This situation reflects trends in many countries of moving away from special school and unit placements for DHH students, resulting from parental and community attitudes and legislative changes over the past decades (Fortnum, Marshall, Bamford, & Summerfield, 2002; Kearney, Bevan-Brown, Haworth, & Riley 2008; Luckner & Stewart, 2003; Power & Hyde, 2002; Powers, 2002, 2003, 2011). It is a reasonable expectation by many DHH students and their families that they will be able to access postsecondary education in the same way as their hearing peers. The reality for these students, however, seems to be that once they leave the compulsory education sector, the support necessary for them to be fully included and complete their studies successfully has largely been at the whim of the particular postsecondary institution they attend.

Even though international obligations and national legislation have increased the responsibilities of New Zealand’s postsecondary institutions, and some appropriate accommodations are being made available, there continues to be concern regarding DHH students’ participation, persistence, and completion at this level of education (Logan, 1995; Sameshima, 1999). The

available literature demonstrates the limited insights into the participation of DHH students in postsecondary institutions in New Zealand. As a result, it is difficult for disability support services, faculties, and institutions to develop evidence-based practices and policies in the area of accommodations and outcomes for these learners.

The intersection between hearing loss and postsecondary education results in complex issues, usually bounded by national priorities and resources, for which innovative, specific solutions are often required. Therefore, it is important to identify how best to meet the needs and expectations of both the students themselves and the institutions they attend. The purpose of the current study, in the context of changed national human rights obligations, legislation, and policies, was to gain insight and understanding of the access, learning, and social participation experiences of this population in New Zealand from the perspective of the students themselves. The study posed the following research questions:

1. What are DHH students' experiences in relation to their social and academic participation in postsecondary education in New Zealand?
2. What barriers do DHH students perceive when accessing academic and social participation within New Zealand postsecondary education institutions?
3. What solutions are institutions and current DHH students utilizing to overcome these barriers, and further, what other solutions might there be?

Methods

Using a mixed-methods design, quantitative and qualitative methods were applied in a manner that allowed the broader features of participants' experiences to be identified and examined in a written survey and individual perspectives to be reflected through their responses to open-ended questions and interviews (Morse & Richards, 2002; Yin, 2003a, 2003b).

Procedure

To maximize participation by DHH students across the New Zealand postsecondary environment, the study adopted a national focus and included students

studying at universities and polytechnics. Initial contact with each of the 31 publicly funded postsecondary institutions' disability office manager to outline the research objectives and request their assistance to identify possible participants was made by the first author. The criteria to be used for selection of possible participants were twofold: The student had identified a hearing loss and had registered with the institutional disability support service. To comply with confidentiality protocols, each institution's disability support services needed to identify and contact prospective participants themselves. Therefore, it was not possible to identify how many of the approximately 800 DHH students estimated to be within this education sector in New Zealand actually received information about the study. The final survey sample consisted of 64 students, from 13 different postsecondary institutions.

Reasons for the response rate are difficult to determine, but communication from the institutions' disability coordinators indicated that not all of the institutions had DHH students enrolled and that some students were not able to respond to the study within its timeframe. In addition, the researchers had no control over the level of promotion given to the study within the various institutions.

Survey

The written survey was constructed around one developed and used by Hyde et al. (2009) in their Australian study and was also informed by studies undertaken at Rochester Institute of Technology (Foster et al., 1999; Marschark, Sapere, Convertino, & Seewagen, 2005) that examined students' access to academic information and the students' sense of belonging and engagement within the postsecondary environment. The survey contained both fixed-choice (quantitative) and open-ended (qualitative) questions. The fixed-choice questions gathered demographic data including age, gender, and current educational qualifications. Further information was gathered about the student's preferred method/s of communication (e.g., spoken English, NZSL, signed English), primary cultural/linguistic affiliation (Deaf, hard of hearing, bilingual/bicultural), type of educational setting in both primary and secondary school, their use of

hearing aids or cochlear implants, and postsecondary programs studied.

Additional fixed-choice questions enquired about types of communication tools used (e.g., FM aids, interpreters), the use of disability support services and generic learning and communication services, and how useful the participants found these supports using a 5-point scale, “not at all useful,” “a little useful,” “somewhat useful,” “very useful,” or “extremely useful.” Questions also asked about students’ self-perceptions of how they felt their hearing loss affected their ability to participate in both academic and social situations on a 5-point scale, “very little,” “a small amount,” “a fair amount,” “quite a lot,” and “a great deal.” Finally, participants were asked to rate their overall satisfaction level with current academic and social experiences. Open-ended questions asked participants to describe highlights and barriers they had encountered in the postsecondary setting. As well, respondents were asked for any recommendations they may have to give DHH students thinking about postsecondary study. Most survey respondents (84%) indicated their agreement for a subsequent interview.

Interviews

Interviews added to the understanding of individual and collective perspectives. In identifying which students to approach for interviewing, the principle of maximum variation sampling was used, which selects cases from the widest possible range across the sample. This was “in order to ensure strength and richness to the data, their applicability, and their interpretation” (Cohen, Manion, & Morrison, 2007, p. 115). Eight participants (>10%) were chosen; their characteristics are shown in Table 1.

The first author, who is qualified and experienced in deaf education and NZSL, conducted all interviews. Seven of the interviews were face to face, in four New Zealand cities, and all were audiotaped for later transcription. The language and communication mode used for each interview depended on the student’s preference. Five students chose to communicate orally using speech, residual hearing, and lip-reading. A qualified NZSL interpreter was provided for two students who preferred to use NZSL as their main form of communication. Due to the remote geographical location of one of the participants, one interview was conducted online using an instant messaging program. This proved to be an acceptable way to interview this participant, who was not a sign language user and had touch-typing ability and excellent English literacy skills. Each interview lasted approximately 90 min.

The interview participants were asked about the institution they were attending and their current program of study. Aspects such as their communication methods used at home and socially and their identity in relation to their hearing loss were also discussed. Further, a number of questions were asked about their academic, social, and emotional readiness for postsecondary education, as well as their postsecondary academic and social experiences.

Data Analysis

To analyze data contained within the written survey accurately, a coding manual was developed, assigning numerical values to various demographic and fixed-choice responses and the coded responses entered into the SPSS statistical software package. Although an analysis of variance was possible with the quantitative

Table 1 Characteristics of interviewees, $N = 8$

	Hearing loss	Primary language/s	Hearing aids (H/A) or cochlear implants (C/I)	Cultural identity	Level of study
1	Profound	NZSL	—	Deaf	Postgrad
2	Severe	English	H/A	Hearing	Postgrad
3	Severe	NZSL/English	H/A	Bicultural	Undergrad
4	Severe/profound	English	H/A + C/I	Hearing	Undergrad
5	Severe	NZSL/English	H/A	Deaf	Undergrad
6	Moderate	English	H/A	Hearing	Undergrad
7	Moderate/severe	English	H/A	Hearing	Postgrad
8	Profound	NZSL	—	Deaf	Undergrad

data gathered, the moderate sample size restricted assumptions of normality and, as such, only proportional data are presented in this report.

All interview recordings were transcribed by the first author as a means of further immersing herself in the data. The interviews were analyzed using thematic analysis (Stake, 1995; Strauss & Corbin, 1998). Initially themes were identified through inductive analysis, including a prior analysis of the literature. Then a method of constant comparison, using open coding, to identify categories and concepts found in the interview texts was used. The use of a software program, NVivo 9, assisted the qualitative data analysis. Once the data reached saturation point, when no new categories were being developed and no new ideas were forthcoming, generalizations were initiated and categorized regarding the experiences shared by participants.

Survey Participants

All 64 participants were current students. Fifty-four (84%) were university students, and 10 (16%) were polytechnic students. Twenty-three respondents (36%) were male and 41 (64%) were female. Of these, 20% had not initially identified their hearing loss at time of enrolment although they had subsequently registered with the institutions' disability support services. As shown in Figure 1, there was a wide range of ages and the majority of respondents (53%) were over 40 years of age at the time of completing the questionnaire.

Participants described their level of hearing loss across four categories: mild, moderate, severe, and profound. These categories are used by the New Zealand Audiological Society (2004) and use terms that adults with hearing loss would be familiar with. Table 2 identifies that a majority of respondents (64%) reported a severe or profound hearing loss. Further, 58% of the total sample had an identified hearing loss at birth or by 3 years of age.

Three respondents indicated they had received cochlear implants; however, two of the three said that they did not use their implant during the course of their postsecondary studies. Of those students who used hearing aids, 64% indicated that they used their hearing aids "a great deal" when participating in postsecondary education.

The majority of respondents (73%) reported that spoken English (or, as in two cases, another spoken language, namely Samoan and Mandarin) was their primary language. NZSL, or NZSL/signed English combined to some extent with spoken English, was the primary communication mode for 17 respondents (27%). In terms of their primary cultural identity, 45

Table 2 Reported levels of hearing loss

Loss	Frequency	Percentage
Mild	3	5
Moderate	20	31
Severe	25	39
Profound	16	25
Total	64	100

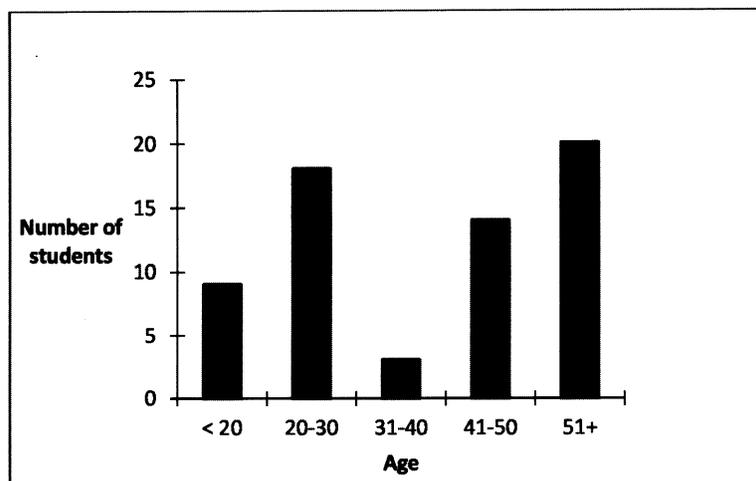


Figure 1 Participants grouped according to age range ($N = 64$).

respondents (70%) identified primarily with a hearing community, 13 respondents (20%) indicated a bilingual/bicultural identity, and 6 (10%) reported that they identified mainly with the Deaf community. Fifty-five students (85%) came from families with no other incidence of hearing loss. Six respondents (9%) had an extended family member, parent, or sibling with hearing loss, and three (5%) came from Deaf families.

No specific or standardized admission tests are used in New Zealand for postsecondary admissions. All participants had been admitted to their university or polytechnic on criteria used within the New Zealand postsecondary sector. These criteria were the high school qualifications from years 11, 12, or 13 or a provisional entry. In New Zealand, once people have reached the age of 20 they have the option of provisional entry to a postsecondary institution, as an adult student. Those gaining entry in this way must complete their first year of study satisfactorily before their enrolment is confirmed. Six students in this study were admitted using this option.

Results

Quantitative Results

Primary and secondary school settings attended. Approximately 92% of respondents were educated in regular classes or at a regular school with a specialist deaf unit, during their primary and secondary schooling. Of note, 60% of respondents who had an identified hearing loss during their school years did not receive any resource teacher of the deaf support during their secondary schooling, although all students with an identified hearing loss would have been eligible for such support. It is unlikely that the students attending regular schools would have been educated using sign language, based on the predominantly oral/aural communication practices for DHH children in New Zealand mainstream educational settings at the time. However, it should be noted that 27% of respondents reported now using NZSL exclusively or NZSL/signed English in combination with spoken English in their everyday lives, and 30% of respondents identified themselves as having a bilingual/bicultural affiliation or as identifying mainly with the Deaf community.

Although the study did not collect data on the group's performance on standardized tests of academic proficiency, the survey did ask students to indicate their highest qualification prior to attending university. Twenty-seven students (42%) had obtained a year 13 qualification, 23 (36%) a year 12 qualification, and eight (12.5%) had passed School Certificate or NCEA Level 1 (year 11). Six respondents (10%) had not obtained any nationally recognized qualifications while attending secondary school.

Academic programs studied. Respondents studied a wide variety of academic programs in their postsecondary institutions. Six of the 64 respondents (10%) were studying education or special education teacher preparation programs ranging from certificate level through to masters level. Other programs included arts (25%), social sciences (10%), sciences (10%), law (8%), commerce (7%), and then medicine, fine arts, theology, music, engineering, and business administration (<5% each). Forty respondents (64%) were undertaking baccalaureate level programs, eight (13%) were undertaking masters level programs, five (8%) were completing a PhD, three (5%) studying postgraduate diplomas, and certificate or diploma levels accounted for a further six respondents (10%).

Communication and participation. The extent to which respondents felt their hearing loss affected their ability to participate in specific learning environments is shown in Table 3. The highest level of difficulty was reported to be in lectures and social functions; the least affected was accessing available support services.

Accessing curriculum and support services. Academic accommodations are largely the focus for disability coordinators providing services to DHH students, according to the policy and resources available in each institution. As shown in Table 4, 54 respondents (85%) had accessed the services of their institution's disability coordinator services during their studies. The most frequently accessed accommodation was note-taking services. Sixteen respondents (25%) had used sign language interpreters as part of accessing their studies. Online access to lecture content¹ is not an

Table 3 Effects of hearing loss on ability to participate in different environments in percentages ($N = 64$)

	Very little	Small amount	Fair amount	Quite a lot	Great deal
Lectures	11% (7)	20% (13)	24% (15)	18% (12)	27% (17)
Receiving instructions or supervision	15% (10)	24% (15)	29% (18)	13% (9)	19% (12)
Tutorials	19% (12)	21% (14)	23% (15)	16% (10)	21% (13)
Accessing support services	40% (25)	28% (18)	10% (7)	5% (3)	17% (11)
Casual interactions with other students	16% (11)	26% (16)	22% (14)	16% (10)	20% (13)
Social functions	10% (7)	15% (9)	21% (13)	21% (13)	33% (22)

Table 4 Usefulness of communication tools and supports in percentages ($N = 64$)

	Did not use	Not at all useful	A little useful	Somewhat useful	Very useful	Extremely useful
Interpreters	75% (48)	2% (1)	0	2% (1)	6% (4)	15% (10)
Disability coordinator	15% (12)	20% (13)	12% (7)	8% (5)	15% (10)	30% (19)
Manual note-taking support	35% (23)	5% (3)	3% (2)	10% (6)	8% (5)	39% (25)
Electronic note-taking support	79% (51)	0	2% (1)	3% (2)	6% (4)	10% (6)
FM aids	79% (51)	2% (1)	6% (4)	5% (3)	3% (2)	5% (3)
Induction loop	92% (59)	3% (2)	0	0	2% (1)	3% (2)
Video conferencing	87% (56)	6% (4)	2% (1)	0	2% (1)	3% (2)
Online access to lecture content	34% (21)	6% (4)	10% (6)	5% (3)	15% (10)	30% (21)

accommodation specifically available to DHH students in New Zealand institutions, but is a service available to all students. However, it was reported as being regularly used and appreciated by the respondents in this study. The three most frequently used and highly rated aspects of the support services were note-takers (47%), disability coordinators (45%), and online access to lecture content (45%).

Academic and social satisfaction levels. Table 5 refers to the students' academic and social satisfaction levels. In terms of the teaching they received and the attitudes of both staff and other students, the majority of respondents felt either "somewhat satisfied" or "very satisfied." However, those levels of satisfaction dropped for both the number of friends in class and the contact they had with other students outside class. Students between 20 and 30 years of age expressed the most dissatisfaction with the number of friends they had in class.

Qualitative Findings

Almost all (97%) of the respondents answered the open-ended written questions on the survey. In reporting the results, we have used direct quotations from the open-ended written responses and interview data to

elaborate on the quantitative findings and extend the depth of understanding available about the learning and social participation of this population.

Barriers to learning and academic participation. In terms of barriers to learning, the quantitative results indicated that a majority of the survey sample reported difficulty in lectures and tutorials because of their hearing loss. The qualitative findings elaborated on this as participants gave details about particular problems. A typical response was

I struggle with group discussion, I always have. I just make sure that I know who is speaking. It is more of a challenge when it's not well controlled and people are dancing all over the place.

A few respondents commented on the lack of awareness that lecturers and other staff had about the impact hearing difficulties can pose in different environments or situations. Barriers identified as directly associated with the courses themselves included (a) the amount of group work involved, (b) the delivery style (e.g., lecture, lab work, web-based), (c) lecturers with significant facial hair or "accents" or a chaotic teaching style, and (d) insufficient classroom lighting, noisy or faulty equipment, and poor acoustics. There were, however, many positive comments about supportive lecturers

Table 5 Academic and social satisfaction levels in percentages ($N = 64$)

	Not at all satisfied	Not very satisfied	Somewhat satisfied	Very satisfied
Teaching received	2% (1)	5% (3)	36% (23)	57% (36)
Attitude of staff	2% (1)	10% (8)	29% (18)	59% (37)
Attitude of students	3% (2)	10% (7)	46% (29)	41% (26)
Number of friends in class	8% (5)	17% (10)	34% (21)	41% (26)
Contact with class members outside class	7% (5)	18% (11)	37% (23)	38% (24)

and staff who tried to make their teaching more accessible and had made genuine efforts to ensure all students were provided with the opportunity to learn. Additionally, the disability support services sometimes provided new technology, such as electronic note-taking services², which the students had previously been unaware or had no experience with during their compulsory schooling. One participant said, “I didn’t know what an FM headset was. It turned out to be my ‘godsend’ for almost a year.”

Although a majority of respondents saw note-taking as a very useful support, there were numerous concerns about note-taking services, including the quality and timeliness of notes received. Examples were given of being unable to read the notes or receiving the notes up to a month after the lecture. Students identified trained note-takers as providing a superior service to manual notes from peers or even manual note-takers who were employed solely to provide dedicated notes for one student. Students who used NZSL also expressed a preference for electronic note-takers, who used programs such as C-Print or Stereotype in certain circumstances, and there may be some potential to use this form of technology to overcome interpreter shortage issues.

It appears that the quality and availability of interpreters to fill the needs of students who relied on sign language as their main mode of communication was inadequate. At times, participants felt that their interpreters were not qualified or experienced enough to convey the content of lectures effectively, and this was a source of frustration for the students. However, students who received interpreter services generally expressed satisfaction with their interpreters and identified that working at this level posed multiple challenges for both interpreters and lecturers.

There was an overall acknowledgment from these students of the importance of having professional and

experienced interpreters and note-takers, as summed up by the following statement:

Finally, getting full-time interpreters and proper paid note takers for the last two years of study made such a big difference and I was amazed at how much info I had missed out on previously.

A number of participants reported difficulties building positive and effective relationships with the disability support staff. Reasons for this included the perceived attitudes and lack of knowledge about deafness of some staff and difficulties with communication. Participants felt it was crucial that disability and academic staff receive “deaf awareness” training prior to having a DHH student. This would include information about appropriate communication methods and other aspects, such as working with interpreters. In the words of one participant:

No Deaf Awareness [is] delivered to course tutors, they did not understand about Deaf students’ needs i.e. getting attention, face-to-face communications, Deaf people’s literacy barriers, when is the right time to interrupt the conversation, way of teaching to Deaf students (i.e. visual, etc).

Further, some participants found themselves having to justify requests for services or accommodations that they felt were logical or requesting intervention from other services or outside agencies to facilitate access.

Qualitative findings indicated that students had reduced access to incidental learning via casual discussions with fellow students. A number of participants indicated that they had good speech and often just “smiled and nodded” so as not to draw attention to their hearing loss. These results indicate that for the majority of the students their learning and academic participation experiences were severely hampered by communication barriers.

Social experiences. A large proportion of the students interviewed cited some level of difficulty with their social interaction at their university or polytechnic. Most displayed an air of resigned acceptance about their loneliness. Some had low expectations about their ability to develop new relationships and satisfied their social needs outside of the postsecondary setting in places such as Deaf club, or with family, or small groups of intimate friends they had known prior to attending postsecondary institutions, rather than on campus.

Students recognized that participating in the wider aspects of campus life produced a positive effect on their feeling of belonging and their overall postsecondary experience. Feelings of isolation, loneliness, and frustration with their lack of social interaction with hearing classmates were identified, and the lack of casual/social interactions indicated that social isolation was a significant factor for many of these students. The following comment, made by a postgraduate student describing her experience as an undergraduate, was a typical response:

I didn't really have any friends at university. I'd simply go to classes, the library and go home. You'd see heaps of other students get together and just hang out—and I didn't have that.

Additionally, students spoke about lack of access to extracurricular activities, stating they were a key part of the overall postsecondary experience and should be accessible. Those who relied on sign language as their main form of communication lamented the lack of interpreting support available for nonacademic activities, and students who used their residual hearing and lip-reading skills frequently found that the activities were arranged in ways that were not conducive to their participation.

Solutions identified by students. The interview participants demonstrated a high level of enthusiasm for the experiences and opportunities that postsecondary education can provide. They were, however, realistic about the issues they faced, and many appeared to have been assertive and proactive in finding solutions to the barriers they encountered. They described a variety of solutions they had implemented, including self-advocacy and self-reliance, ensuring that they knew

what supports they were entitled to and promoting the availability of these supports. Participants viewed informing other students and staff about deafness and having the persistence to see things through to completion as important. They further identified the need to disclose their hearing loss to staff and other students in order to gain understanding and appropriate assistance and to improve their participation academically and socially. Underlying this was the need for strong identity and self-belief, as these are a key part of empowerment for these students. Suggestions for obtaining supports included asking for one-to-one sessions with lecturers to clarify their teaching or assessment requirements and developing a solid support network that includes family and friends.

There was overwhelming encouragement from the participants to other DHH students considering tertiary education, to “give it a go,” persevere, and experience postsecondary study in order to realize their potential and reach their goals. There was a feeling that if more DHH students pursued a postsecondary education, awareness of deaf issues would increase, as would the skill base of the deaf community, as in this advice to DHH people considering postsecondary study:

We need more people like us in university to increase the awareness of deaf issues, but also to increase our skill base. Always use the resources that are available. Don't be put off by negative attitudes. Stand up for your rights. Use your support groups to help you, as university is not easy.

Discussion

Through a mixed-methods approach, the study obtained some quantitative information about the experiences of DHH students in postsecondary education in New Zealand, with the qualitative findings elaborating upon and illustrating those findings. The combined findings revealed that pursuing further education beyond secondary school posed many challenges in New Zealand institutions, which were largely unprepared to support the access and participation of DHH learners. However, a postsecondary education also provided positive experiences and benefits. Analysis of the findings identified the following as being salient for success: (a) establishing and maintaining positive

educational experiences, (b) having access to support services and assistive technology, and (c) the quality of communication and social interactions with others.

The majority of participants in the study had a severe or profound hearing loss that had occurred at birth or by the age of 3 years. There was a high use of hearing aids and auditory–oral communication, with most continuing to communicate via speech and lip-reading as part of their primary language use, after leaving school. Further, over half of the participants (60%) had not received resource teacher of the deaf support during their secondary schooling. The current study's findings echoed research that identified that students with good oral communication skills often tried to “blend in” by denying or minimizing the effects of their hearing loss, preferring to rely on their lip-reading ability and residual hearing (Menchel, 1998; Richardson, Long, & Woodley, 2004; Schroedel, Kelley, & Conway, 2002; Spradbrow & Power, 2004).

There was a perceived sense of independence among these students that may have influenced their initially low expectations of the support they would require at the postsecondary level. This might explain why 20% of the respondents in this study initially chose not to declare their hearing loss when enrolling at an institution, although they had registered with the relevant disability support service by the time this survey was conducted.

Just over half of the students who responded to the study were aged over 40. This parallels with U.S. Department of Education (2010) data that show that students with hearing loss tend to be older than the general student population and reflects some data collected in New Zealand. Available New Zealand data do not identify DHH student percentages, but refers instead to students with disabilities in general. For example, “Students who had a disability were more likely to be aged 40 years and over. In 2009, 41 percent of disabled students were in this group compared to only 27 percent of total students” (New Zealand Ministry of Education, 2010, p. 58).

The 85% of the survey participants who had used their institution's disability support services, including note-taking, interpreting, and alternative assessment accommodations, reported high levels of satisfaction. It is interesting that a number of students were registered

with the disability support services but not accessing them, a finding that is consistent with earlier studies (e.g., English, 1999; Hyde et al., 2009; Luckner, 2002). Conversely, the qualitative findings indicated that some students had initially approached disability support offices for assistance, but chose not to continue to use the services offered. A significant number of students chose not to engage, or to minimize their involvement, with disability support services because they felt staff attitudes and communication were less than ideal. Participants reported that disability support staff often lacked the knowledge necessary to understand or assess DHH students' needs effectively and had no understanding of the cultural needs of Deaf students.

As identified earlier in the results, this group of DHH students studied a wide range of programs that reflected their own interests and perceived abilities. Unlike the findings in Hyde et al. (2009), the most common degree program at undergraduate level for these students was a Bachelor of Arts, not a degree in teacher education, even though one of the universities with a larger proportion of DHH students had a teacher of the deaf program.

The quantitative findings indicated that a majority of respondents reported being “satisfied” or “somewhat satisfied” with both the teaching they received and the attitudes of staff and students in the learning environment. The qualitative findings identified students' frustration with academic staff who assumed that providing note-takers, tutors, and interpreters was all that was necessary for DHH students to achieve participation and equity. These supports undoubtedly help, but as Bills, Ferrari, Foster, Long, and Snell (1998) found, there is a danger in staff assuming that this is all that is required. This assumption reflects limited understanding of inclusive education and is about issues of student access and not about participation and effective engagement (Hyde, Carpenter, & Conway, 2010). Participants indicated that more staff training was required to provide institutional staff with appropriate knowledge and communication techniques to address these issues.

With new forms of technology currently available to support learning and communication in postsecondary education, it was important to investigate whether students were able to use such

tools as electronic note-taking (C-Print, Stereotype) or videoconferencing (a “virtual classroom” that included PowerPoint lecture material, sign language interpreted video, chat, and text opportunities). Both have strong potential for use with this population (Power & Power, 2010; Stinson, Elliot, Kelly, & Liu, 2009). All of the institutions in the study have access to these technologies; however, it is clear from the data that they were not in common use at the time, with only 21% of respondents using electronic note-taking and only 13% using videoconferencing. This is disappointing given that various technologies have the ability to provide environments that are more accessible for those who are DHH (Belcastro, 2004; Slike, Berman, Kline, Rebilas, & Bosch, 2008) and could have easily been made available to the students.

The most frequently used forms of technology were software programs such as Blackboard or Moodle, for curriculum access, and email, as a means of communicating with staff or classmates. Even though these technologies are available to all students, the high level of use and perception of usefulness reported how valuable these tools are for DHH students.

Students whose primary means of communication was NZSL were provided with interpreting services, but they raised concerns about both the shortage of interpreters and the variation in quality of the service provided. As in Australia (Hyde et al., 2009), the United Kingdom (Traynor et al., 2003), and the United States (Marschark et al., 2005), there is a chronic shortage of qualified and experienced interpreters with the ability to provide adequate interpreting services at the postsecondary level. In addition, some participants felt that lectures were never fully accessible to them, regardless of the approach that interpreters used. These concerns have been highlighted in previous studies about interpreting services provided for postsecondary students (e.g., Harrington & Traynor, 1999; Jones, Clark, & Soltz, 1997; Knox, 2006; Komesaroff, 2005; Menchel, 1998; Power, 1990; Russell & Demko, 2006; Sameshima, 1999; Traynor et al., 2003). However, these students also made positive comments that revealed a high level of appreciation for the interpreting services they received and indicated an understanding of how difficult it was to provide complete and accurate interpreting in the postsecondary environment.

Unlike the United States and many other countries, New Zealand does not have any specific training for educational interpreters who work in either the compulsory or postsecondary education sectors. Reffell and McKee (2009) observed that although funding is available for interpreters in New Zealand postsecondary institutions, a shortage of interpreters often compromises the availability of this service and this was borne out by the findings in this study. Considering some signing students preferred electronic notes to interpreters, combined with the chronic shortage of interpreters available and qualified to the high level needed for academic interpreting in the postsecondary sector, it would appear that electronic note-taking has the potential to be a valuable service for signing students. It can also be useful to students who rely on lip-reading and their residual hearing in lectures and tutorials. Stinson, Stinson, Elliot, and Kelly (2004) found that deaf U.S. college students

... rated comprehension with the real-time display of the speech-to-text service as greater than comprehension of an interpreter. They also reported that the saved text of the speech-to-text service was more helpful than note taker notes. (p. 2)

As well as academic inclusion, a significant factor contributing to student satisfaction is the perception of adequate inclusion in the social system of an educational institution (Stainback & Stainback, 1996). Crucial to the success of students in higher education is their level of satisfaction with their social experiences; in this, DHH students do not differ from hearing students (Hyde et al., 2009; Lang, 2002; Lehmann, Davies, & Laurin, 2000; Stinson & Walter, 1997). Findings identified that students had trouble with both social and academic interactions. The quantitative findings indicated some dissatisfaction in the area of social interactions with peers, and the qualitative findings expanded on these revealing feelings of rejection, loneliness, and isolation. These findings echo earlier investigations of Brown and Foster (1991), Menchel (1998), Mudgett-DeCaro and Foster (1992), and Stinson & Walter (1997) who observed similar experiences with mainstream postsecondary DHH students. The current study's interview participants spoke of their struggles to interact with their hearing

peers in ways they found personally satisfying and expressed their disappointment with the effort other students made to communicate with them. This was particularly evident as most institutions had very small numbers of DHH students, and the ability to interact with DHH peers was limited at best.

Further, although it is known that interaction in extracurricular activities is a fundamental part of life for any student (Tinto, 2002), the current study indicated that DHH students still do not have the support they need to participate fully in extracurricular activities, reflecting earlier findings (e.g., English 1993; Stinson & Walter, 1997). Students described the difficulties they had in terms of accessing activities such as debates, sports teams, or social events. A lack of social integration can have serious implications for DHH students, as without feeling part of the wider fabric of the institution, there is a higher chance of experiencing feelings of isolation and loneliness, which can affect students' ability or willingness to persist with their studies. Making postsecondary institutions more fully inclusive necessitates ensuring interpreters or text captioners are available at extracurricular events and activities, thus enabling meaningful interactions between DHH and hearing students outside formal lecture and tutorial situations. This area of social interaction needs more attention from postsecondary institutions if they are to provide a truly inclusive environment for DHH students.

Study Limitations

This study included volunteer participants who had already declared that they had a hearing loss prior to this study's commencement. From other studies (Hyde et al., 2009; Richardson, 2009; Richardson et al., 2004; Riddell, Tinklin, & Wilson, 2005), we know that many students do not declare their hearing loss when participating in postsecondary education. The study consisted of both undergraduate and postgraduate students with a wide range of ages represented. Consequently, the students who elected to take part may not fully represent the complete set of characteristics of all New Zealand DHH students currently enrolled in postsecondary education. Further, the study involved self-report methods and participants may not recall with full accuracy actual events. However, given the small number of DHH students in

postsecondary education in New Zealand, the sample had a good representation of gender, age, and degrees of hearing loss. As well, there was a mix of communication modes, a variety of postsecondary institutions attended, and appropriate geographical representation.

Although the in-depth interviews involved a small number of students, the purpose of qualitative findings is not usually for generalization, but instead to provide insights into the experiences and perceptions of study participants (Taylor, Bogdan, & Walker, 2000). Viewing the study as an initial investigation is appropriate, and additional research on this topic as identified should be undertaken in New Zealand.

Conclusion

If we follow trends seen in the United States, Australia, and the United Kingdom, where at the start of this century nearly three-quarters of DHH 18- to 29-year-olds in the United Kingdom progressed to higher education, compared to only 2% of the DHH school leavers who did so 50 years earlier (Dye, Kyle, Allsop, Denmark, Dury, & Ladd, 2000), then the number of New Zealand DHH students who see postsecondary study as a natural progression in their career path will increase.

Mainstream postsecondary settings can pose unique challenges for DHH students and those who seek to provide appropriate resources to enable them to complete their studies successfully. Powers (1996, 2002) was of the opinion that inclusion is a philosophical concept based on community membership and is a value system, not a place or a particular set of learning circumstances. Using that particular lens, it appears there is a genuine desire within New Zealand postsecondary institutions to provide DHH students with an inclusive education. Most institutions did their best to provide services and accommodations when they were requested. However, inclusion in the postsecondary system for DHH students still appears to focus on "a place or set of learning circumstances" rather than community membership and participation. The results of this study identified that many disability coordinators, and their respective institutions, focus on students' academic inclusion. It is of concern that the postsecondary education system does not currently address students' social inclusion in any intentional way.

Most DHH students in New Zealand attend postsecondary institutions where there are few other DHH students, and this presents a different learning environment from institutions with larger numbers of DHH students found in other countries such as the United States, Australia, and the United Kingdom. This study obtained important findings regarding how students in postsecondary institutions with small numbers of DHH students dealt with the various challenges of participating in classes, obtaining appropriate and adequate access services and becoming socially integrated into campus life.

Institutions with small numbers of DHH students need not only to develop systems and procedures that can assist these students to be included in the range of education experiences but also to work from the principle of empowering the students to become independent and resilient. The factors of choice, access, and empowerment should be to the forefront of any move toward inclusive postsecondary education if DHH students are to be equal and valued participants.

Notes

1. Online access to lecture content: web-based software used for course management and delivery. It may be used in a distance learning setting so students can take part in a real-time online class or as a supplement to lecture-based courses by providing lecture notes, online podcasts, resources, discussion forums, assignment information, and grades.

2. Electronic note-taking: sometimes referred to as speech-to-text transcription services, provide students with an account of the lecture in one of three ways—with a stenographic type machine, voice-activated software, or a standard computer keyboard. C-Print, for example, is a speech-to-text system developed at NTID in which a trained captionist, skilled in using an abbreviation system and the use of text-condensing strategies, produces text of the spoken information.

Conflicts of Interest

No conflicts of interest were reported.

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Erratum

Maxwell-McCaw, D. & Zea, M. C. (2011). The Deaf Acculturation Scale (DAS): Development and validation of a 58-item measure. *Journal of Deaf Studies and Deaf Education*, 16, 325–342. DOI:10.1093/deafed/enq061

In Table 3b (page 333) there are two sets of numbers under the heading “Hearing cultural

involvement.” The second set (items 37 through 46) should instead be under “Hearing preferences” (i.e., items 37 through 56 should be shifted one column to the right).

The authors apologize for the error.