RIDBC Teleschool™: Innovation in Remote Service Delivery

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In 2002, The Royal Institute for Deaf and Blind Children (RIDBC) in Sydney, Australia recognized that many families living in rural and regional areas of Australia were not able to access adequate support for their child's hearing loss because professionals with appropriate qualifications and experience are in short supply in regional and rural Australia (Employment, Workplace Relations and Education Committee, 2002). In response to this inequity, RIDBC created an innovative program known as RIDBC Teleschool which successfully utilizes videoconferencing technology to provide specialist hearing support to children and their families. The aim of RIDBC Teleschool is to provide families in rural and regional areas of Australia with access to the same level and quality of service available to families living in metropolitan areas. RIDBC Teleschool supports children from birth to 18 and typically provides a one-hour individualized videoconferencing session each week. There are 85 preschoolers and 30 school age children across Australia who are currently enrolled in RIDBC Teleschool. In 2004, RIDBC received a grant from the Australian Federal Government to support the ongoing development and expansion of RIDBC Teleschool. Part of this funding was used to employ a Multimedia Educational Designer who could develop resources to complement and enhance the videoconferencing sessions. By combining the use of videoconferencing and specifically designed multimedia resources, RIDBC Teleschool has produced a number of innovations in remote service delivery.

In setting up a videoconferencing program, RIDBC Teleschool considered two types of videoconferencing: personal and professional. Personal videoconferencing typically includes a personal computer, a webcam and free software. Professional videoconferencing includes a television monitor, a high-end videoconferencing camera and dedicated hardware which is usually embedded in the camera. As expected, there are pros and cons with each type of system. Personal videoconferencing is inexpensive to set up and the ongoing costs are minimal with weekly sessions often incurring little or no cost once the system has been set up. The set-up time is minimal if an appropriate internet connection is already in place. Personal videoconferencing equipment is basic and an average computer user can resolve most technical issues. However, the size of the computer screen and the physical workspace may be too limiting for instructional purposes, especially with young children. Also, personal videoconferencing is conducted over the public internet which can

result in delays in transmission as well as audio and video signals being out of sync. The transmission speed is limited to the speed of the slowest participant meaning that if you have a high speed connection but your recipient has a slow speed connection, your transmission speed will slow to meet theirs. Delays, asynchronous transmission and slow speeds are inadequate for sign language use and also limit the participant's ability to access lip-reading cues. Professional videoconferencing, on the other hand, provides a dedicated connection, fixed speed and synchronous transmission. These features improve the quality of the video signal as well as the synchronicity of the audio and video signal. The dedicated videoconferencing camera also has a better quality lens than a webcam, lending an additional level of clarity to the video signal. The professional system allows greater flexibility in manipulating camera angles at both locations and allows the teacher to vary the input by using auxiliary equipment such as a visualiser or laptop computer connection. The size of the television monitor increases the student's level of engagement and the larger workspace allows for greater flexibility in instruction.

These benefits do come at a price, however. Professional videoconferencing equipment is expensive both in the initial set-up and in terms of ongoing monthly fees when compared to personal videoconferencing. The technical issues can also be more complex, requiring support from an ITC professional. The set-up can take weeks or even months depending on the availability of internet connections, the remoteness of the location and the knowledge of local installers. After trialling both options, RIDBC Teleschool determined that professional videoconferencing equipment provided the best option for direct instruction to children and parents. Personal videoconferencing equipment was useful for initially establishing regular contact with a parent, for maintaining consistent service when a local studio unavailable and as an interim measure while a family was waiting for in-home equipment to be installed. Professional videoconferencing equipment was most effective in working directly with a child especially when using sign language or lip reading as instructional tools. The quality and reliability of the connection allow the child to remain engaged in the learning process without technical interruptions. The television monitor typically has a larger screen size and is located in a more comfortable working space than the family computer. These factors make a television monitor the preferred option for videoconferencing with young children.

When a family first enrols on RIDBC Teleschool, videoconferencing takes place using an ISDN connection in a studio location near to the family home. Studios are often located in community buildings such as hospitals or universities. Established studios typically employ a technical support person who can assist with any technical problems that might arise. This relieves families of the need to master the technology instantly and allows them to focus on the content of the sessions. By easing the family's anxiety level about the technology, they can slowly become accustomed to working in a videoconferencing environment and become confident in operating the equipment independently. After eight to ten sessions in a studio setting, families are offered the option of having videoconferencing equipment installed in their home. The equipment is loaned to families for the duration of the child's enrolment and RIDBC Teleschool assumes the monthly connection costs. Most families take up the offer of in-home videoconferencing as it reduces the amount of travel time necessary, allows greater flexibility in scheduling and provides an opportunity for other family members to participate in weekly sessions. From the professional's perspective, in-home videoconferencing serves as a 'virtual home visit' and allows teaching staff to see family life firsthand. This situation enables the staff to teach parents how to enhance their child's natural learning environment by encouraging interactions and communication with the people and resources already present in the home. By providing families with videoconferencing

equipment in their homes, specialist hearing support has become even more accessible to a greater number of families.

Different types of connections are used in the home depending on the technology available in the local area. These connections include SDSL, Cellular and Satellite technologies. SDSL (Symmetric Digital Subscriber Line) is a broadband technology similar to ADSL (Asymmetric Digital Subscriber Line). The primary difference is that SDSL provides the same high speed rate for both uploading and downloading while ADSL has a slower upload speed. Cellular videoconferencing uses a special purpose modem to transmit a broadband signal using cellular phone technology. SDSL and Cellular connections are provided through a Private Broadband Network to reduce the amount of contention experienced when using a typical internet link. Satellite videoconferencing transmits data using a satellite and requires the installation of a satellite dish at the family home.

In our experience, the most effective transmission rate for all three technologies has been 384 kilobits per second. This rate provides clear video and audio signals while maintaining a stable connection between the two sites. Faster speeds can result in a degradation of the connection resulting in more frequent freezing of the video signal or dropping of the signal altogether. Future changes in telecommunications infrastructure should see the consistent availability of higher broadband speeds which may allow for more reliable videoconferencing at faster rates.

The initial objective of RIDBC Teleschool was to pioneer the use of videoconferencing to provide highly specialised hearing support to families living in rural and regional Australia. Through intensive training and development RIDBC Teleschool was able to achieve this objective and begin shifting the focus from videoconferencing technology to the full integration of interactive multimedia resources into its service delivery model. Now, multimedia instructional resources are regularly used to support and enhance videoconferences and to assist in the dissemination of personal and professional support. A variety of current and emerging multimedia, including print, video, cd-rom, web, and portable media are used to develop and distribute innovative educational resources.

Traditionally, multimedia production has been outsourced to a production company. However, there has been a recent shift which has seen the integration of multimedia production as a role undertaken within an organization. This is evident within the corporate, advertising, and education sectors. Within RIDBC Teleschool, this change has enabled teachers and therapists to collaborate with multimedia designers on a daily basis. This environment has given teachers and therapists greater exposure to multimedia and a unique understanding of how to utilise new media technologies in the delivery of specialised support. Equally, it gives multimedia designers invaluable insight into sensory disabilities. This unique ecosystem has fostered the development of several innovative projects at RIDBC Teleschool.

One such project is a multimedia resource used to teach Australian Sign Language (Auslan). This project is known as the RIDBC Auslan Tutor and uses the Apple iPod to deliver a truly portable and comprehensive Auslan teaching solution in a predictable learning hierarchy for hearing users. Individual video clips are used to teach Auslan by modeling the handshape, followed by the individual sign, then the sign in a phrase and finally, the phrase in a sentence. This structure allows the user to build upon their previous knowledge as they move through the various video clips. It also allows the user to see the sign demonstrated a number of times in a number of ways. This particular structure enables the user to expand his/her understanding of the sign in different contexts. The RIDBC Auslan Tutor moves beyond the basic premise of teaching an individual sign or group of signs by also offering instruction in Auslan grammar through the Auslan note included

for each entry. This improves the user's understanding of intricacies of the language and enables the user to become a more proficient communicator in Auslan. The application of the RIDBC Auslan Tutor to a portable media device allows the user to have immediate access to a teaching environment on demand in any situation. The portability increases the amount of instruction that the user can access, providing ongoing learning opportunities throughout the day in a variety of settings. This accessibility improves the daily interactions between the user and their communication partner.

Another multimedia project developed by RIDBC Teleschool is the RIDBC Teleschool website. This website integrates highly collaborative and social applications to engage and educate families and service providers. Users create a personal online profile, which gives them access to both public and private spaces. The public space gives them access to comprehensive instructional resources, including songs, toys, and activities that they can use with their child; compelling articles written by other parents; and parenting articles written by professionals. Forums, parent-authored blogs, and interactive message boards are also included to foster communication and networking between families. This function gives parents the opportunity to find and talk to other parents in similar situations, and develop a social support network that their various remote locations would not otherwise permit. The private component of the website allows video clips from the user's videoconference sessions to be posted by their RIDBC Teleschool consultant. These short clips are posted with added feedback, detailing additional follow up suggestions. This online archive and review process provides a special opportunity for parents to reinforce their learning. It also allows parents absent from the videoconference sessions, other family members, and local service providers to keep updated and involved in weekly videoconference activities.

The RIDBC Teleschool Model has proven to be a successful application of new and emerging technologies to meet the needs of deaf and hard of hearing children. Videoconferencing has proven to be an effective method of service delivery because it allows families in rural and regional areas to have regular face-to-face contact with experienced professionals and to access specialised hearing support without having to travel great distances. The use of in-home videoconferencing further reduces the amount of travel time necessary, allows greater flexibility in scheduling and provides the opportunity for other family members and local professionals to participate in weekly sessions. The integration of interactive multimedia resources into the service delivery model complements the videoconferencing component of the model. Within a videoconference, multimedia resources provide visual variety and serve to engage the participants more fully. Outside of videoconference sessions, supplemental multimedia resources provide opportunities for additional learning, a support network, self-evaluation and ongoing review of the child's progress. The effective use of a range of existing and emergent technologies eliminates the inequity of access that exists in rural areas and provides an avenue for families to obtain the same level and quality of specialist hearing support as families living in metropolitan areas.