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Perspectives on assistive technology: What teachers, health professionals, and speech and language pathologists have to say

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There is very limited information regarding current practices in the field of assistive technology, particularly in Canada. This research project was undertaken to address this limitation and to gather information in the following areas: 1) the current levels of and satisfaction with training in assistive technology; 2) current funders of assistive technology; 3) barriers associated with assistive technology use; and 4) the importance and availability of support strategies. This project involved a general survey of the perspectives of teachers, speech and language pathologists, and health professionals across the province of Alberta. This paper presents the results of the survey and discusses the implications in regard to improving practice.

Introduction

Assistive technology (AT) refers to a wide range of devices, services, strategies, and practices that are conceived and applied to ameliorate the problems faced by individuals who have disabilities (Cook & Hussey, 2002). Assistive technology can offer students with disabilities access to the regular education curriculum and tools for adults throughout the lifespan (Johnston, Beard, & Carpenter, 2007).

The provision and implementation of assistive technology requires the involvement and services of a multidisciplinary team of individuals that may include the individual with a disability, an assistive technology specialist, teachers, an administrator, parents, a psychologist, a health professional (physical/occupational therapist), and a speech and language pathologist (Johnston, Beard, & Carpenter, 2007) . The team will likely be involved in the assessment of the needs of the child or individual; the selection, purchase, setup and repair of the assistive

technology; training and technical assistance; and the provision of education to the user, family, and other professionals. Knowledgeable participation by these professionals in these processes is critical to successful assistive technology use. All of the professionals involved need to work together and collaborate, crossing disciplinary boundaries to promote success.

Although advances in the field of assistive technology have been made in research and development, what is actually occurring in the field is not clear. Information regarding the practices and needs in the field is limited. This research project attempts to address this limitation by investigating the following areas: 1) the current levels of, and satisfaction with, training in assistive technology; 2) current funders of assistive technology; 3) barriers associated with assistive technology; and 4) the importance of, and the availability of support strategies. This project involved a general survey of the perspectives of professionals in the field, teachers, health professionals, and speech and language pathologists across the province of Alberta. This paper presents the results of the survey, examines the similarities and differences among the perspectives of the different professional groups, and discusses the implications in regards to improving practice.

Methodology

Survey Development

Three separate, but similar, surveys were developed, one for each professional group. The basis for the items for the survey was drawn from published articles, research papers, and textbooks. Survey questions were refined using a focus group of professionals representing each of the professional groups. The final version of each survey consisted of the following: demographic questions, a yes/no question regarding training in the field, a question asking for information regarding the nature of the training, a question asking participants to rate their skills and knowledge in AT, an open ended question asking the participants to identify funders of assistive technology, a list of 12 items to be rated on the extent they act as barriers, a list of 10 items to be rated

on their importance in AT service provision, and numerous opportunities to provide comments.

Survey Distribution

The three surveys were distributed to each professional group through their respective professional associations and were included in a monthly newsletter mail out throughout the province. A total of 2000 surveys were sent to teachers, 800 to health professionals, and 500 to speech and language pathologists. The return rate was 4% for the teachers (n = 129), 8% for the speech and language pathologists (n = 32), and 16% for the health professionals (n = 87).

Results

Teachers. The survey requested descriptive information on the respondents themselves. The majority of the teacher respondents were special education teachers or special education facilitator/consultants. A minority of the teacher respondents were regular classroom teachers. Several were counsellors, school administrators, or assistants. The majority of the teacher respondents reported that they taught at elementary and junior/senior high school levels. A smaller number of teachers indicated that they taught preschool or kindergarten. The teachers reported a range of years of teaching experience from 0 – 35 years.

Of these teachers, 70% reported that they had not had any opportunity to be in-serviced in the area of AT or taken any previous coursework. Of the teachers that reported opportunity for training, 12% had completed in-services at a provincial rehabilitation hospital, 12% had received training from vendors, 9% had attended workshops and conferences, 1% received training from a consultant, 1% were self taught, and 1% had received training from their school division. When asked to rate their current level of skills and knowledge in AT, 22% of the teachers indicated that they were unskilled, 54% indicated that they needed support, 24% indicated that they were somewhat proficient, and none indicated that they were very proficient.

Table 1
Teachers – Current level of training

Level of Proficiency	Teacher Rating Percentage
Unskilled	22
Need Support	54
Somewhat Proficient	24
Very Proficient	0

Of these teachers, 26% were very dissatisfied with their current skills and knowledge, 60% were somewhat dissatisfied, 14% were satisfied, and none were very satisfied with their skills and knowledge.

Table 2
Teachers – Ratings of satisfaction

Level of Satisfaction	Teacher Rating %
Very dissatisfied	26
Somewhat dissatisfied	60
Satisfied	14
Very Satisfied	0

The teachers were asked to identify the funders of the assistive technology used in their classrooms. The majority of the teachers indicated that the primary funder of AT devices was the school/board/district/program. A minority of the devices were funded through community organization and fundraising activities. A number of AT devices were purchased directly by parents and some were procured through government funding or grants.

Teachers were asked to rate the importance of support strategies for AT implementation. The teachers rated funding as the most important strategy. Specific equipment training for staff and students received the next number of high ratings, followed by awareness level training for

Table 3
Teachers – Funders of AT equipment

Funder	Percentage of time identified
School/board/district/program	53
Community organization/fundraising	16
Government funding/grants	15
Parents/family	5
Uncertain	11

staff, time to program, setup , and customize equipment, availability of equipment, release time for training/inservice, and availability of equipment (Table 4). In addition, the teachers provided many personal comments related to importance of support strategies for AT. The majority of the comments focused on funding; "there are no funds to purchase assistive technology," one teacher commented, and "devices are scarce and expensive," explained another. Other comments focused on time and training. One teacher reported, "It is very frustrating to have AT purchased for the school/students, and then not to have training in how to use/help the students use the technology; thus it sits there, and is not used!"

Table 4.
Teachers – Ratings of support strategies – Percentage of times teachers rated each item as a significant support.

Support Strategies	Percentage of time rated as a significant support
Funding	84
Equipment training	68
Awareness training	67
Time to program, setup, and customize equipment	67
Release time	64
Availability of equipment	64

Teachers were asked to rate the extent to which items on a list act as a barrier to AT use. The teachers rated the expense of AT as the most significant barrier. Time to become proficient in AT use received the next highest ratings, followed by time to program equipment. Lack of AT equipment for students and availability of support also received high

ratings (Table 5). Interesting, acceptance by parents and/or administration was not seen as a barrier by the teachers.

Table 5.
Teachers – Top 5 Ratings of Barriers – Percentage of times each barrier was rated as a substantial barrier

Barriers	Percentage of time rated as a significant support
Expense	66
Time to be proficient	60
Time to program equipment	54
Lack of equipment	48
Availability of support in the classroom	46

In summary, the teachers responding to the survey were primarily involved in special education. Of these teachers, 70% indicated that they had not had an opportunity to be trained in assistive technology. Those teachers with training had participated in workshops, conferences, and training by venders. The majority of the teachers reported that they need support in the areas of assistive technology, some are still unskilled, some are proficient, and none reported that they were very skilled. Eighty-six percent of the teachers expressed dissatisfaction with their current level of skills and knowledge. Teachers reported that the primary funder of AT was the schools, although community support and fundraising were also used. Parents and families also funded assistive technology purchases. Very little government support was reported. The most important support needed to implement assistive technology indicated by the teachers was funding, followed by opportunity for training, and provision of time. The barrier most often encountered was expense of the assistive technology. Time, lack of equipment, and classroom support were also rated among the most significant barriers.

Health Professionals. The survey requested descriptive information on the respondents themselves. The majority of the health professional respondents, 71%, practiced in an urban setting. Twenty-six percent practiced in a rural setting and 3% practiced in both urban and rural settings. Of these health professionals, 38% worked with children from birth to 5 years of age, 37% worked with children ages 6 – 12, 31%

worked with adolescents 13-18 years of age, and 67% worked with adults.

Of these health professionals, 87% reported that they had the opportunity to be in- serviced in the area of assistive technology or had taken previous coursework. Only 13% reported that they have had no opportunity for training. The majority of the health professionals (40%) indicated that they had received their training during their undergraduate degree at university or in a university course on assistive technology. Sixteen percent of the health professionals indicated that they have participated in inservice activities and 14% reported that they received training at a provincial rehabilitation hospital. Others received training at conferences (7%), clinics (1%), workshops (6%), personal research (2%), and telehealth training (2%).

When asked to rate their current level of skills and knowledge in AT, 9% of the health professionals indicated that they were unskilled, 51% indicated that they needed support, 38% indicated that they were somewhat proficient, and 2% indicated that they were very proficient.

Table 6.
Health Professionals – Current Level of Training

Level of Proficiency	Health Professionals Rating Percentage
Unskilled	9
Need Support	51
Somewhat Proficient	38
Very Proficient	2

Of these health professionals, 9% were very dissatisfied with their current skills and knowledge, 59% were somewhat dissatisfied, 30% were satisfied, and only one respondent was very satisfied with skills and knowledge in assistive technology.

Table 7.
Health Professionals – Rating of Satisfaction

Level of Satisfaction	Health Professionals Rating Percentage
Very dissatisfied	10
Somewhat dissatisfied	59
Satisfied	30
Very satisfied	01

The health professionals were asked to identify the funders of the assistive technology in their practice. The majority of the health professionals indicated that the primary funder of AT devices was community organizations, fundraising, or charity. Others reported funding from family or parents, government organizations, insurance, and facility or department purchase.

Table 8.
Health Professionals – Funders of AT Equipment

Funder	Percentage of time identified
Community organization/fundraising	37
Parents/family	30
Government funding/grants	14
Schools/boards/education funding	10
Insurance	5
Facility or department purchase	4

The health professionals were asked to rate the importance of support strategies for AT implementation. Similar to the teachers, the health professionals rated funding as the most important strategy. Availability of equipment was the second most highly rated strategy, followed by access to expert technical support/consultation. Both availability of training and specific equipment training for staff/students were also rated very high (Table 9). In addition, the health professionals provided many personal comments related to importance of support strategies for AT. Again, similar to the teachers, the majority of the comments focused on funding; "funding is the most significant barrier." One health professional commented, "funding and the ability to keep current are huge barriers for AT, as well as ongoing support to educate teachers and support staff each new year."

The health professionals were asked to rate the extent to which items on a list act as a barrier to AT use. Similar to the teachers, the health professionals rated the expense of AT as the most significant barrier. The time available to become proficient was rated as a significant barrier the second most often, and lack of AT equipment was rated next.

Table 9.
Health Professionals – Percentage of time each item was rated as a significant support

Support Strategies	Percentage of time rated as a significant support
Funding	86
Availability of equipment	78
Access to technical support	73
Availability of training	62
Specific equipment training	62

This was followed by availability of support and time to program AT equipment

Table 10.
Health Professionals – Percentage of times each item was rated as a substantial barrier

Barriers	Percentage of time rated as a substantial barrier
Expense	71
Time to be proficient	45
Lack of equipment	41
Availability of support	32
Availability of training	31

In summary, the health professionals responding to the survey worked with a range of clients in age from birth to adult, and served in both urban and rural areas. In contrast to the teachers, 86% of the health professionals reported that they had training in assistive technology. The majority of these health professionals had received their training in university course work, others reported attending inservice activities, workshops, conferences, clinics, and telehealth training. These health professionals reported that they need support in the area of assistive technology but, in contrast to the teachers, significantly more health

professionals reported that they felt somewhat proficient in assistive technology. Fewer health professionals than teachers expressed dissatisfaction with their current level of skills and knowledge and 31% were satisfied or very satisfied with their training. Health professionals reported that the primary funder of AT was the fundraising, community organizations and charity although parents and family were also heavily relied on. Schools were also reported as funders of assistive technology and, to a lesser degree, government organizations. Similar to the teachers, the health professionals indicated that the most important support needed to implement assistive technology was funding. Availability of equipment, access to expert technical support, availability of training, and specific tool training were also rated as very significant. Again, similar to the teachers, the barrier most often encountered by health professionals was expense of the assistive technology. Time, lack of equipment, and classroom support were also rated as the most significant barriers.

Speech and Language Pathologists. The survey requested descriptive information on the respondents themselves. The majority of the speech and language respondents, 50%, practiced in an urban setting, 46% practiced in a rural setting and 4% practiced in both urban and rural settings. In addition, the majority of the speech and language respondents service clientele between the ages of birth and 18 years of age.

The majority of the speech and language pathologists, 97%, reported that they had received their training during their undergraduate degree at university or in a university course on assistive technology. Only 3% reported that they had not had any opportunity to be in-serviced in the area of AT or had not taken any previous coursework. The other major source of training was in-service and workshops provided by a provincially based rehabilitation hospital. When asked to rate their current level of skills and knowledge in AT, 12% of the speech and language pathologists indicated that they were unskilled, 38% indicated that they needed support, 44% indicated that they were somewhat proficient, and 6% indicated that they were very proficient.

Table 11.
Speech and Language Pathologists –
Current Level of Training

Level of Proficiency	Speech and Language Pathologists Rating Percentage
Unskilled	12
Need Support	38
Somewhat Proficient	44
Very Proficient	6

Of these speech and language pathologists, 13% were very dissatisfied with their current skills and knowledge, 59% were somewhat dissatisfied, 22% were satisfied, and 6% were very satisfied with their skills and knowledge.

Table 12.
Speech and Language Pathologists –
Rating of Satisfaction

Level of Satisfaction	Health Professionals Rating Percentage
Very dissatisfied	13
Somewhat dissatisfied	59
Satisfied	22
Very Satisfied	6

The speech and language pathologists were asked to identify the funders of the assistive technology in their practice. The majority of the speech and language pathologists indicated that the primary funder of AT devices was government organizations. Other significant funders were schools or school boards, community organizations or charity, and the individual, family or parents.

Table 13.
Speech and Language Pathologists –
Funders of AT equipment

Funder	Percentage of time identified
Government organization	34
Community organization or charity	22
School or board	18
Family, parents, individual	16
Unsure	10

The speech and language pathologists were asked to rate the importance of support strategies for AT implementation. Similar to the teachers and the health professionals, the speech and language pathologists rated funding as the most important strategy. Written comments included, "Funding is typically the major issue," "funding limited the type of device or increased (the) time waiting." Availability of equipment was the second most highly rated strategy, followed by access to expert technical support/consultation. Both availability of training and specific equipment training for staff/students were also rated very high (Table 14). The speech and language pathologists were asked to rate the extent to which items on a list act as a barrier to AT use. Similar to the teachers and the health professionals, speech and language pathologists rated the expense of AT as the most significant barrier. The time available to become proficient was rated as a significant barrier the second most

Table 14.
Speech and Language Pathologists – Percentage of time each item was rated as a significant support.

Support Strategies	Percentage of time rated as a significant support
Funding	81
Time to set up equipment	78
Availability of training	75
Access to expert support	72
Availability of equipment	73

often and lack of AT equipment was rated next. This was followed by availability of support and time to program AT equipment (Table 15). In addition, the speech and language pathologists provided many personal comments related to importance of support strategies for AT. One respondent indicated that "there is a problem getting a device on site, caseloads are huge, and time… is limited. As well, budget money is limited and (AT tools) are not always around…"

Table 15.
Speech and Language Pathologists –Percentage of times each item was rated as a substantial barrier

Barriers	Percentage of time rated as a substantial barrier
Expense/cost	66
Lack of AAC equipment available	60
Time to learn tool	53
Time required to program tool	47
Availability of support	38

In summary, the speech and language pathologists responding to the survey worked with a range of clients from birth to adult, with the majority serving children in both urban and rural areas. Similar to the health professionals, the speech and language pathologists, 97%, reported that they had training in assistive technology. The majority of these speech and language pathologists had received their training in university course work at both the undergraduate and graduate levels. The other source of training reported was in-service and workshops provided by a provincial rehabilitation hospital. The majority of the speech and language pathologists, 44%, reported that they are somewhat proficient in the area of assistive technology. This group of professionals reported a higher level of competence in the area of assistive technology than any other group. Although speech and language pathologists reported the highest level of competence, 59% still expressed dissatisfaction with their current skills and knowledge. Only 28% were satisfied or very satisfied. The speech and language professionals reported that the primary funder of AT was the government or government agency. Other funders included the individual, family or schools, and community organizations and schools and school boards. Similar to the teachers and the health professionals, the speech and language pathologists indicated that the most important support needed to implement assistive technology was funding. Time to set up equipment, availability of training, access to expert support and availability of equipment were also identified as being very important. Again, similar to the teachers and the health professionals, the speech and language pathologists identified the barrier most often encountered was expense of the assistive technology.

Discussion and Conclusion

The data from these surveys raises significant concerns regarding the current practice of assistive technology in Alberta and provides direction as to implications for improving practice. First, although two of the professional groups reported that they had received preservice training in AT at the undergraduate level, there appears to be serious shortcomings in the preservice training provided for teachers. The majority of teachers reported that they had no opportunity for preservice training in this area and were unskilled or needed support. These data indicate a serious issue in teacher preservice training. If teachers are going to effectively participate in assistive technology teams, including the assessment of student for AT, the implementation of AT in the classrooms, and evaluate AY use, they must be adequately prepared to do so. Preservice teachers must receive sufficient training to at least have a minimal level of competence in this area. Assistive technology units or modules need to be incorporated in existing courses on teaching the academic areas, such as reading, writing, and math, and be included in course content regarding teaching strategies, such as conducting assessments, facilitating social behavioral development, writing IPPs, and so on. Assistive technology modules could also be included in course content focusing on integrating technology in the classroom.

Second, there also appear to be shortcomings in the opportunities for continuing development in the area of assistive technology for all three professional groups. The data from the teachers, health professionals, and speech and language pathologists indicated that the majority of individuals were dissatisfied or very dissatisfied with their currently level of skills and knowledge in the area. The teachers reported the highest level of dissatisfaction, but 68% of the health professionals, and 72% of the speech and language pathologists also expressed concerns. Although most of the professionals across the three groups reported that they currently access workshops and in-service activities in their school boards or at a provincial rehabilitation hospital, and participated in specific device training, they would like to be better trained in the area. It can be a challenge for busy educators and educational professionals to find time within the school year for extra training, and access to training

is often in centralized areas that are difficult to reach for rural residents. Perhaps access to training through flexible distance opportunities might help to address this concern. Other strategies to make information more readily available might include a telephone information hotline with AT specialists, a provincial AT newsletter, and opportunities to network such as symposia or conferences.

Third, without exception, all the stakeholder groups surveyed indicated that funding of assistive technology tools was likely the most significant barrier to implementation. These groups identified parents and families, schools and boards, community organizations and charity as sources of funding for assistive technology. There were few indications that government funds were readily available. This is a significant area to address. The provision of AT tools facilitates participation in education and fosters independence for the child with disabilities in the classroom, home, and community environments and could be seen to be as essential as glasses and hearing aids. There should be a reliable source of a minimal level of funds available for students with disabilities available at the provincial level. Although this would not eliminate the expense and funding barrier, as some equipment is very costly and low cost options may not be sufficient, it would provide a start to equipping students.

Fourth, the availability of AT equipment was identified as a significant concern for two of the stakeholder groups. The availability of equipment would be somewhat addressed if funding sources were more readily available; however, there is still a need to be able to access equipment quickly for a trial basis without incurring purchase costs. A centralized equipment resource loaning agency could help with this problem. In addition, an initiative to help schools and agencies communicate needs for AT and a way to share equipment might also prove helpful.

Fifth, access to expert support in the area of assistive technology was identified as being a significant concern. Access to expert support would vastly improve with increased training opportunities for teachers, speech and language professionals, and health professionals. Ideally, every school district should have access to an individual or team of individuals that could support and facilitate AT use.

Finally, lack of time was identified as a significant barrier in assistive technology implementation for all stakeholder groups. Time for training, programming tools, providing support, etc., seem to be at a premium. Administrative support and commitment that the provision of assistive technology supports is a priority, is very important.

Despite the relatively limited return rate for all three stakeholder groups, the information gathered in this study consistently indicated that there are a number of issues to be addressed in Alberta regarding the implementation of assistive technology. The issues of lack of appropriate training and support, insufficient funding, difficulties managing equipment, and time constraints, are well documented in the literature (Copley & Ziviani, 2004; Derer, Polsrove, & Reith, 1995). The teachers, speech and language pathologists, and health professionals surveyed in Alberta expressed strong perspectives and observations on the implementation of AT in their schools and practice. These perspectives provide a clear message as to the strategies that could enhance the availability and use of AT for individuals with disabilities.

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