Practices of recycling assistive technology in Quebec

CLAUDÉ VINCENT

KEY WORDS
Assistive technology devices
Policies
Recycling

ABSTRACT
The aim of this study was to document professional factors to be considered in implementing a provincial policy of recycling assistive technology in Quebec. A qualitative study was conducted with 22 experts from various sectors: health professionals (including occupational therapists), industry and community. They were interviewed using a semi-structured questionnaire. Data collection also involved observing recycling practices and analyzing working documents. Implementation strategies were considered from the perspectives of health professionals, the commercial sector, users of assistive technology and government administrators. Factors that contribute to tension between occupational therapists and other players are discussed. It is recommended that occupational therapists take a united position on this issue such that their voices may have more weight in intersectoral collaborations.

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RÉSUMÉ
Une étude qualitative a permis de documenter un ensemble de facteurs à considérer en vue de la mise en œuvre d’une politique de valorisation (recyclage) des aides techni ques au Québec. Grâce à la participation de 22 experts provenant des secteurs de la réadaptation, de l’industrie et du communautaire, une collection d’informations a été effectuée à travers des entrevues semi-dirigées, l’observation de pratiques de recyclage et à l’aide de documents de travail. L’implantation d’une politique de valorisation des aides techniques devra être considérée selon les points de vue des professionnels de la santé, du secteur commercial, des usagers et de l’administration publique. La discussion aborde les facteurs qui suscitent des controverses en ergothérapie. Il est proposé que les ergothérapeutes s’entendent sur les rôles, les responsabilités et la philosophie à adopter concernant la valorisation et la recommandation des aides techniques pour assurer le succès d’une éventuelle politique de valorisation intersectorielle.
Occupational therapists have traditionally played a key role in the provision of assistive technology (AT) both in clinical and community settings (Bynum & Rogers, 1987; Demers, Weiss-Lambrou, & Ska, 1994; Forbes, 1990; Mann & Lane, 1991; Trudel, 1994; Trudel & Filiatrault, 1997). In the province of Quebec, the concept of recycling AT has received attention in the past (Trudel & Filiatrault, 1997). There has been a growth of recycling depots or alternatively called central equipment pools, that store used wheelchairs, lifts, beds and a plethora of other AT. More and more, occupational therapists are having to deal with the issues and challenges posed by the recycling of assistive devices. However, there is a paucity of data regarding the role of occupational therapists with respect to the recycling of AT and the issues related to this practice. The role of the occupational therapist, however, cannot be considered in isolation from the broad range of forces, policies and players that may be involved in the overall shaping of recycling practices.

In a report presented to the Quebec Ministry of Health in November of 1996, the subject of recycling AT was discussed within a more global policy document on the provision of AT overall (Conseil consultatif sur les aides technologiques (CCAT), 1996). Recycling involves an entire spectrum of procedures. These range from recycling products for their original use to regenerating AT from the raw materials of recycled products. The question remains, however, what factors or conditions will ensure the successful implementation of a recycling policy in Quebec? The aim of this paper is to present factors that may contribute to successful policies regarding the recycling of AT. Factors were identified through a four year study on this topic (Vincent, 1997). Because this practice involves many different sectors, this paper presents position statements from health professionals (including occupational therapists), the commercial sector, consumers and government administrators. In this paper, there is a particular focus on the opinions of occupational therapists.

This paper begins with a statement of the problem regarding a policy concerning the recycling of AT and a literature review which includes a justification for the conceptual model chosen. A qualitative approach enabled the researcher to focus on the various strategies and conditions that could be instrumental in ensuring the success of a recycling policy. The discussion section deals more specifically with the practical implications for occupational therapists with respect to the formulation of a policy concerning the recycling of AT.

Statement of the problem

Who is most likely to benefit from a policy of recycling AT? The Health and Activity Limitations Survey conducted by Statistics Canada in 1991 revealed that 12.5% of the Quebec population reported limitations in mobility and dexterity. This percentage translates to 854,185 individuals who could potentially benefit from AT. The increasing demand for AT through public programmes has outgrown funding available for these programmes. In spite of increasing expenditures, the supply for AT has not met the demand for them. Furthermore, the demand for AT is foreseen to increase given the aging of the population. The CCAT (1996) estimated that in 1993, more than 30,000 persons who needed AT had not yet received them through the provincial health care plan. The Health and Activity Limitations Survey, in fact, estimated that 247,000 Canadians requiring assistive devices, did not receive them (Statistics Canada, 1991).

This disconcerting situation is paradoxical. On the one hand, one cannot emphasize enough the contribution that AT can make in terms of improving independence. However, as budgets are increasingly being cut, the most vulnerable clients who rely on public funding are being deprived. In Quebec, the eligibility criteria are very strict and the waiting list for AT can be up to several years. This has the greatest impact on the most disadvantaged and older persons (most often elderly women) with limited financial means. (Statistics Canada, 1991). Trudel (1994) proposed better control and monitoring of the use of AT by clients in order to improve access. One solution would be to put systems in place to collect, repair and distribute aids and also make the clients more accountable.

A second paradox exists. Those who dispense AT often denounce the loss or abandonment of assistive devices without, in turn, trying to influence the development of public programmes to collect and redistribute them to those in need. Many authors have highlighted the non-use of AT in the United States (Bynum & Rogers, 1987; Cushman, & Scherer, 1996; Garber & Gregorio, 1990; Mann & Lane, 1991; Mann, Hurren, & Tomita, 1993; Merbitz, 1996; Rogers & Holm, 1992; Smith, 1996; Yasuda & Hanten, 1985), in Great Britain (Hart, Bowling, Ellis, & Silman, 1990; Karpman, 1992), in Sweden (Gosman-Hedstrom, Aniannsson, & Persson, 1988; Philips & Zhao, 1993; Parker & Thorslund, 1991, 1993) and in Australia (Keating, McLean, & Quinsey, 1989). That phenomena is also present in Canada (Conseil consultatif sur les aides technologiques, 1994; Demers, Weiss-Lambrou & Ska, 1994; Forbes, 1990; Finlayson & Havixbeck, 1992 ; Vincent, 1993). Abandonment of AT often occurs due to biological changes (death, improvement or deterioration of function), lack of acceptance, the discovery of another alternative, or dissatisfaction with the AT (the aid is uncomfortable, too heavy or cumbersome).

Ministries of health involved with AT programmes remain very reserved on the question of recycling given the lack of guidelines available for the content and conditions required to put a recycling policy into effect. This may be true for ministries in Canadian provinces who haven't formally adopted such a programme. Thus, this study aims to find out which factors should be considered to ensure the success of a policy regarding the recycling of AT. Existing recycling practices and the hands-on experiences of key players in this field were analyzed for this purpose. The perspectives of occupational therapists are also highlighted in this paper.
Literature Review

Recycling AT is a concept that integrates a range of practices. Table 1 displays terms related to recycling as defined by the special provincial committee (CCAT, 1996) with examples of each type of practice. These terms include, recycling, reusing, reconfiguring and regenerating (Association française de normalisation, 1983; Communauté économique européenne, 1984; Groupe En d'autres termes de l'Université de Sherbrooke, 1990).

In the original provincial document which was in French, all these practices are categorized terms under the heading of valorisation des aides techniques. However, for this paper, all these practices are categorized under the term of recycling. This set of terms stops short of defining processes related to final discarding of products. Simply discarding products without any consideration to recycling is harmful to the environment. Therefore, regeneration (creating AT from recycled raw materials) is encouraged before final discarding of any AT.

Most European countries do not yet have recycling programmes at the provincial or national level. Only Great Britain and Denmark have developed a national recycling programme in collaboration with the Red Cross and the municipal councils. Recycling programmes are usually initiated by regional councils (Sweden), community agencies (Belgium, Italy, Luxembourg), private insurance (Germany) or industrial partnerships (U.S., Ireland). Canadian provincial projects have been carried out in Alberta, Saskatchewan and Manitoba; pilot projects also exist in British Columbia, Ontario, New Brunswick, Nova Scotia and Yukon (CCAT, 1996). The Alberta Aids to Daily Living programme is actually considered the best delivery model for AT because the practice of reassigning AT meets clinical needs and at the same time is economical (CCAT, 1996). At present, no such formal programme exists in Quebec or in many other provinces.

Recycling mainly takes place at the local level. A recent provincial study found that even in the most pessimistic scenarios, recycling could be institutionalized in three programmes of the Quebec provincial health insurance programmes and subsequently save 10 million dollars of the 72 million that was invested in 1993 (CCAT, 1996). The Council estimated that 30% of AT provided through the provincially funded programs could have been recycled in some way, saving $56 million annually. These projections took into consideration factors concerning ethical, health and safety standards in their recommendations to the Ministry of Health.

In order to assess factors that contribute to the success of a policy for recycling AT, a conceptual model that includes different stakeholders potentially affected by recycling in different contexts, is needed. It was important to choose a conceptual model that permitted negotiating with four different sets of stakeholders: experts in health sector, experts in industry, users of AT, and experts in government administration at different levels.

Choice of conceptual framework

In 1995, Contandriopoulos presented a conceptual model that was based on the regulation of the health care systems. Regulation here is defined as the incentives and laws that orient actions of the players and agencies in the health care system (Contandriopoulos et al., 1993). This model was chosen to form the theoretical framework for the study of recycling AT. Figure 1 presents the conceptual model that was adapted to interpret the numerous and divergent visions of various partners in the field of AT regarding conditions for a policy of recycling of AT. Figure 1 contrasts four ideological poles which various groups of players use to form their philosophical basis for

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Table 1

Definitions of terms used with respect to recycling

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
<th>Examples</th>
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<tbody>
<tr>
<td>Recycling</td>
<td>Action which involves making available an AT or part of an AT, for its original purpose.</td>
<td>Restoring (as a new one) a lift to distribute to a future client (with new pieces)</td>
</tr>
<tr>
<td>Reusing</td>
<td>New use of a part of an AT.</td>
<td>Collecting pictures of persons or settings from a communication board that can no longer be used, for installation on an adapted telephone.</td>
</tr>
<tr>
<td>Reconfiguration</td>
<td>New use of an AT for an analogous but lesser purpose than its original use.</td>
<td>Making a wheeling chair functional again with used pieces</td>
</tr>
<tr>
<td>Regeneration</td>
<td>Process by which, with the replacement of raw materials, an AT can be made.</td>
<td>Melting thermoplastic materials collected from discarded AT and using them to make orthoses.</td>
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</table>

Note 1. Adapted from Conseil consultatif sur les aides technologique, 1996 p. 46-50
The model postulates that the recycling of AT involves continual negotiation between the political group, the market group, the professional group and the technocratic (or bureaucratic) group involved in the overall running of the health care system.

The recycling of AT can be viewed from the perspective of professional ideology whereby health professionals (including occupational therapists) desire greater autonomy in the distribution of resources including AT. Professionals, however, through training, education and self-regulation are expected to guarantee an acceptable level of practice and have the power to revoke the licenses or certification of professionals deemed to be incompetent.

The recycling of AT can also be governed exclusively by a business philosophy of market principles such as supply and demand (Contandriopoulos, 1995). Contandriopoulos et al. (1993) present the concept of a “mixed market” where the means of regulation includes the coexistence of public and private providers in the same health care system. This mixed market involves both public payers and health care centres making offers to private companies that manufacture AT. Both public and private markets share common ideas such as maximizing efficiency.

The recycling of AT could be left in the hands of those who subscribe to bureaucratic or technocratic ideology. Concepts that are categorized under this ideology include administrative procedures, technical means, norms, legislation and regulations concerning the recycling of AT. Regulation by administrative and professional incentives are situated between the poles of technocratic reasoning and professional regulation (Contandriopoulos, 1995). These types of professional incentives may be administered by public servants and by the state.
to influence decisions made by professionals. Finally, adminis-
trative incentives could be implemented to encourage innova-
tions by administrators that would still ultimately serve both
individuals and organizations in need.

The health care system could equally be administered
according to a democratic or political ideology. The stakehold-
ers who hold to this perspective refer to a democratic model
whereby, in principal, citizens own the right to influence deci-
sions and sociopolitical actions at the heart of their society
(Contandriopoulos, 1995; Contandriopoulos et al., 1993). Ac-
Accordingly, politicians, promotional agencies for the rights of
the disabled, and militant citizens make their point of view
known, attempt to justify their actions and try to mobilize suf-
cient legitimacy to influence change at the social and polit-
ical level.

Although the six proceeding ideologies render justice to
certain values in favour of recycling, definitions of the kind of
regulation by professionals and the market should be extended
to rehabilitation. The model was thus expanded to include the
perspectives of designers (eco-design) and consumers under the
pole of the commercial sector. The former takes into account
the discussion of designers and engineers who evaluate the
quality and the safety of these devices. The latter incorporates
discussions of consumer satisfaction with users of recycled AT.
It should be noted that these two perspectives coexist in the
commercial and professional worlds. This conceptual framework
coupled with qualitative research methods was utilized to dis-
cuss with different players, the issue of recycling and to observe
different recycling practices.

Methods

Research design

A qualitative approach was utilized in this study using a partic-
ipatory research paradigm (Elden & Chisholm, 1993; Reason,
1994a, 1994b). This strategy was used because it enabled one
to take into account the milieu studied and local practices. It
also maximized the participation of persons involved in this
phenomenon studied and allowed the critique of each mem-
bers' role. Moreover, this participatory research strategy equally
permitted a triangulation of many data collection procedures.

Participants

Since a list of recyclers was not available, the participants were
recruited at two scientific congresses and at one engineering
exhibit involving assistive devices. The research protocol was
presented at these meetings where the investigator took note
of many key persons that attended the presentation. Later on,
29 participants were contacted by telephone and the research
protocol was sent to all of them by fax. In total, 22 participants
agreed to participate in the project in total. Experts were recruit-
ed from Sherbrooke, Montreal, Trois-Rivières and Quebec City.

Collaborators in this project included:

- ten experts from the health care system (professional
group)
- one from the government administration (technocratic
group)
- eight from industry (market group) and
- three users of AT in the community (political group).

The health care professionals included eight occupational
therapists, one physical therapist and a director of an AT pro-
gramme. At the end of the study, the person from the provin-
cial committee who studied recycling of AT was interviewed.
From the manufacturing and commercial sector, interviews were
conducted with two managers in charge of business and sales,
one industrial designer, a mechanic specializing in repairing
orthoses and prostheses, two engineers, and two professors in
biomedical and industrial design. Members of the Canadian
Association of Muscular Dystrophy and the Quebec Paraplegic
Association, who are users of recycled AT were also inter-
viewed.

Data collection

The main research questions posed in the interview were as fol-
ows:

1. What were the respondents experience with recycling AT?
2. What are the factors that could contribute to the success-
ful implementation of a policy of recycling AT?
3. What are the advantages and disadvantages of doing this?

An interview was conducted with each study participant from
the four interest groups (market, professional, bureaucratic and
political) in four different periods. This method of collecting
data through different time periods was promoted by Guba and
Lincoln (1989). The discussions took approximately one to two
hours to complete. All the interviews were transcribed. Three
weeks after each interview, each participant was sent a tran-
script of their interview. This gave the participants the oppor-
tunity to be more specific and to make corrections if they
wished. Ten participants did so. Five case examples of recycling
were also written from the data from two interviews of persons
in industry and from nine interviews in the health sector. The
researcher returned the transcribed case examples to the
experts for validation. All the results from the analysis and each
case example were assembled into one working document that
was returned to all participants for validation and critique. Of
the 22 respondents, 15 experts critiqued and returned the
working document (in the health sector (9/11), in the commu-
nity sector (2/3) and in industry (4/8)). Participants were con-
tacted up to three times to respond to the document.

Data analysis

Qualitative analysis of data was conducted using the
Nonnumerical Unstructured Data. Indexing Searching
Theorizing. (NUD..IST) software program (Richards & Richards,
Using a tree-like structure, this software programme facilitates the organization of raw data, theoretical and operational variables. Theoretical variables refer to ideas or concepts in the literature that explain part of a complex phenomenon. Operational variables refer to ideas or notions grounded in the field or context that can explain part of the studied phenomena. In qualitative research, raw data often consists of verbatim text from documents and field notes. In this study, data were analyzed as follows: each of the principal and second branches of the tree-like structure were dedicated to a theoretical variable that came from the model of regulation described above. For example, under a principal branch named technocratic ideology there were secondary branches named rules, laws and norms. Accordingly, the third tier of branches were designated as operational variables and subsequently named by the researcher: e.g. norms of the rehabilitation centre regarding recycling. All the verbatim transcripts, the text from the non-official documents and the field notes were categorized under the appropriate operational variables: e.g. under norm of the rehabilitation centre regarding recycling, "there are no provincial standards or norms for recycling AT, but the market recycles anyway... Thus, as a rehab centre, we establish our standards of recycling". The NUD IST software program enables rereading of all interview transcripts, extraction of pertinent information and categorization of the raw data under operational variables. All operational variables are attached to theoretical variables that come from the regulation model. If a particular data point could not be effectively classified under a theoretical dimension, the researcher could modify the conceptual model and rectify any errors of classification that may be present. NUD IST was also useful in collecting descriptive data used to describe contexts of recycling. The following section describes the recycling contexts and the factors that could contribute to successful policies of recycling AT according to the conceptual framework.

Results

The description of the context of recycling by participants was included in another publication (Vincent, 1998b). Five case studies were identified through interviews and validated by participants.

- Case 1: A private company lends and sells recycled lifts
- Case 2: The Canadian Muscular Dystrophy association recycles AT in collaboration with a private company
- Case 3: Two AT services recycle wheelchairs internally with financial assistance from the Quebec Public Health Insurance Programme.
- Case 4: Two rehabilitation centres and a school recycle AT to serve their clients with the permission of the Quebec Office of Disabled Persons.
- Case 5: Three local community health centres recycle used AT to maximize independence at home; recycling is conducted internally and in collaboration with private companies.

Factors that could contribute to successful policies of recycling of AT are presented according to a conceptual framework. The question of reusing AT was examined through perspectives presented in the conceptual framework: from the viewpoints of health professionals (professional group), from the political viewpoints (group of members of Associations of handicapped persons), from the market viewpoints (group of businessmen and group of engineers & designers), the technocratic group (one person from government administration) and the perceptions on professional (different groups) and management incentives (different groups).

Health professionals/occupational therapists viewpoints.

Table 2 shows five major elements that should be considered by occupational therapists. First, the experts who were interviewed examined whether one should encourage the establishment of a central equipment pool within each department or instead, contribute to greater accessibility by working within regional centres. Some occupational therapists thought that centralized depots of AT would enable sharing of equipment among institutions. Because central equipment pools included a variety and quantity of AT, it would be possible to create clinical and technical evaluation instruments and to conduct client satisfaction studies. These occupational therapists worked more as consultants or coordinators. Other occupational therapists reported that central equipment pools facilitated clinical interventions. The availability of used AT could mean that the client could receive an assistive device more quickly. Also, the availability of recycled assistive devices provided opportunities to try an assistive device out more readily. An occupational therapist could also use this equipment to do personal demonstrations.

Secondly, occupational therapists should consider how long the client needs AT. If needs are temporary, for example for convalescent or progressive illnesses, then AT can be easily retrieved after a few weeks when a client's needs change. If clients have long term needs, for example, persons with disabilities or elderly persons, AT can be lost after a few years if there is no efficient system that monitors the lending of AT.

Third, the responsibilities of occupational therapists with respect to this practice should be defined. Ten experts including seven occupational therapists identified numerous responsibilities for occupational therapists inherent in the provision of AT. There should first of all be a shift in the attitude of only prescribing new AT. Each clinician should be assured that the AT provided meets the client's needs (efficacy of AD), is used efficiently by the client, is durable and is cost-effective. One recommendation is that follow-up visits should be instituted to retrieve the product if not used, or to reassess the AT if necessary. Other options or alternatives that can be considered include the use of normal products already on the market,
using compensatory techniques or home solutions that are often more appropriate and efficient than the provision of AT. However, several experts have remarked that there is no consensus on the practice of occupational therapy with respect to the provision of AT. Academics, the Ordre des ergothérapeutes du Quebec (OEQ) and practicing clinicians have not come to an agreement or a rationale regarding provision of AT.

Fourth, there is a need to specifically define the role of occupational therapists at each stage of recycling. Certain experts believe that occupational therapists can influence establishments to implement a formal follow up of used AT, while others believe that only occupational therapists can be responsible for the monitoring of this equipment. Two occupational therapists and two experts from the commercial sector identified four roles for occupational therapists who were interested in the recycling of AT. Occupational therapists may observe the training of clinicians in an institution who make use of such AT. Occupational therapists often act as consultants for establishments or other professionals who do not have expertise in recycling or prescribing AT. Occupational therapists also play a pioneering role in the promotion of recycling. For example, they encourage clients to return their unused AT if not used any more, and often initiate the strategy of recycling in their local area. Also, occupational therapists develop a business relationship with the recycling company.

Fifth, there is the question of whether clinicians are aware that different philosophies towards rehabilitation and community influence the provision of AT? Some occupational therapists feel uncomfortable with the way recycling is administered in their milieu because there is differential treatment of clients according to the type of insurance they have. Clients with insurance are more likely to receive a more client centred approach where their needs will be evaluated before the purchase of an AT such as a wheelchair. Clients without public insurance or any other type of insurance coverage, may only get what is available from the manufacturer without the advice or guidance of a professional. Clients without public insurance will often buy used AT and not seek professional services, due to limited funds. For example, clients will often buy a recycled motorized wheelchair without the advice of a physical or occupational therapist. This situation may pose risks to the client’s health, well-being and function. For example, giving a motorized

<table>
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<th>Elements</th>
<th>Factors</th>
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<tbody>
<tr>
<td>1. Establishment of recycling depot</td>
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<tr>
<td>• centralized depots of AT</td>
<td>• sharing among institutions</td>
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<td></td>
<td>• clinical evaluation instrument</td>
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<tr>
<td>• local depots of AT</td>
<td>• satisfaction studies</td>
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<td></td>
<td>• technical evaluation instrument</td>
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<td>2. Considering client’s needs when recommending an AT</td>
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<td>• temporary needs for AT</td>
<td>• convalescent</td>
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<td>• progressive illness</td>
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<td>• permanent needs for AT</td>
<td>• person with disabilities</td>
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<td>• elderly persons</td>
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<td>3. Taking the responsibility of referrals of AT</td>
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<td>• efficacy of AT</td>
<td>• alternatives to AT</td>
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<td></td>
<td>• efficiency of AT</td>
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<td>• rationale for new AT</td>
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<td>• durability of AT</td>
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<td>4. Professional roles taken by Occupational Therapist</td>
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<td>• training</td>
<td>• promoting recycling</td>
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<td>• follow-up of use of AT</td>
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<td>• consulting</td>
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<td>5. Questioning the philosophy behind AT referral</td>
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<td>• manufacturer’s procedure versus client-centred approach</td>
<td>• functional independence</td>
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<td>• quality of life</td>
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Note 1. The organization roles of professional practitioners should also be considered a strategy and a condition of implementing the content of a policy of maximizing the use of AT.
wheelchair to a client may accelerate deterioration of health and function even if quality of life is increased in the short term. For young people with paraplegia, a manual wheelchair will be recommended to keep the client active and in good physical condition. With an advanced progressive muscular dystrophic clientele however, a motorized wheelchair may not only be more comfortable but may also help conserve energy for other activities of daily living. Therefore, underlying philosophies at referral may be linked to those of maintaining and improving physical function and quality of life.

Political/ users viewpoints. The users expressed that satisfaction was linked with improvements in independence and everyday quality of life. This is particularly true for disabled persons with limited financial resources or those who cannot rely on public or private insurance to pay for the AT. Recycled AT provided an opportunity for these individuals to buy, borrow or rent more readily and at lower prices. Users expressed more satisfaction when convinced that the recycled device fits properly, was clean and met needs and standards of safety in the same way a new AT would.

The users expressed frustration over the fact that many disabled persons desperately need AT in order to be more independent, and yet there are AT that are not being used at all elsewhere. Participants stressed that wasting AT is part of a societal phenomenon that encourages more consumption rather than recycling. The participants compared many disabled persons to consumers at large where access to health insurance improves access to AT. Unfortunately, there is not much promotion of recovering used aids that are often left in closets and simply forgotten perhaps for many years. This situation was reported by the three consumers and also by three other participants.

Market/ businessmen viewpoint. Some businesses take advantage of reusing AT. Some companies, private laboratories of AT and public programmes, rent and resell recycled equipment at a lower cost. Because these organizations make their own devices and repair them, they are easily able to maintain second hand equipment in stock. Some companies promote their second hand products as part of their marketing strategy. They attempt to create a new line of versatile products that can be reused in different ways. These products are being marketed as being easy to repair and upgrade, having detachable parts, portable, adaptable to different disabilities, easily adjustable and can be delivered rapidly. An example is a wheelchair that has interchangeable backrests and armrests.

Some companies fear that recycling will affect the volume of business especially with respect to custom made AT for specific purposes. Custom made AT need more adjustments, are often built with less resistant material and are less likely to be portable and adaptable for multiple uses. Therefore, there is competition between these two types of products. However, there will always be a demand for each type of product. The manufacturing sector also pointed out that over-recycling can adversely affect research and development. In fact, if the same products are recycled indefinitely without upgrading them in any way, research and development will be die. Over-recycling results in keeping obsolete products on the market, by repairing, buying and selling them over many years. The classic example is that of an old model wheelchair which is still in use in long term care institutions. Therefore, persons in this sector emphasized the importance of maintaining balance between recycling and progress. For example, when it is time to replace equipment, members of this sector recommend buying new equipment. In this way, inventories in institutions would be upgraded incrementally, and obsolete AT would eventually be eliminated. It is important to regularly upgrade inventory with value added products. If this is not done, it might lead to a situation where all users with private insurance would have the newest products while those mostly dependent on public sources of funding would only be left with obsolete AT.

Market/ engineer designer & viewpoints. The following questions arose concerning the design of AT. Which ones are really suitable for reuse on the market? Which AT can be adapted for different types of clients? Which ones can be easily repaired? Which ones have detachable parts? Can we only change or update a piece of equipment or do we have to change the entire device? These questions highlight the importance of the type of AT actually available on the market. The designers and engineers that design AT are divided by their own professional values (often environmental and practical) and the demands of their companies and the market. For instance, a company may require the development of an electronic communication table which has a certain market cost. The company targets children 12 and over with oral communication problems coupled by limitations in motor function. The company insists that the product cannot be repaired or taken apart by other competitors. This requirement poses constraints for the designer who wishes to develop a product that can be easily adapted or upgraded for many types of clients (eg. Braille keyboard, other types of keyboards that can be interchangeable). The product could then be considered like a black box. Some companies however, do encourage designers to develop wheelchairs that are easily adapted and upgraded. Certain wheelchairs for instance have easily interchangeable parts even from earlier models. These wheelchairs however, are more expensive to buy but some of the initial cost can be recouped if the wheelchair can be reused over time. These scenarios were reported by two engineers, a mechanic specialized in the repair of orthoses and prostheses, two professors in biomedical engineering and industrial design, and an industrial designer.

Technocratic/ viewpoint of one person from government administrators. For this study, it was impossible to recruit public payers of AT. Only a representative from the provincial committee who studied recycling of AT for the Conseil consultatif sur les aides technologiques was willing to participate. When interviewed, this person explained that large insurance compa-
nies such as those that provide automobile insurance, workers compensation and services for Veterans have stayed out of the debate because they operate in the same manner as private insurance. When a client is compensated, the money belongs to that client. Similarly, the client owns the AT once it is provided for him or her. The AT becomes the client’s property and thus private insurance no longer has control over it. Recovery of aids is therefore not feasible. On the public insurance side, the Quebec public health insurance plan and the Quebec Office of Disabled Persons did not have any formal procedures in place, but have always encouraged health professionals to reuse AT when appropriate. However, if there was no interest on the part of the health professional store to recycle, for example, a wheelchair or a lift that served a temporary role, public administrators had no control over those unused products.

The person from the provincial committee who studied recycling of AT explained that in public health insurance organizations, most managers are against recycling AT because of the lack of directives from the Quebec Ministry of Health. Administrators, especially in the hospital and rehabilitation settings, stated that it was not in the organization’s mandate to repair, clean, store and manage a recycling department for AT, especially if this equipment is paid for by other agencies. However, some managers, particularly in local community health and social service centres (CLSC) have managed an official lending department within their organization, with the support of their Regional Administration or their regional federation of community health service centres. Some of these centres have created partnerships with the private sector for the maintenance of certain AT.

Perceptions on incentives for professionals. Regarding the incentives for professionals, the support of an employer is essential to motivate occupational and physical therapists to reuse AT. This support could start with providing adequate inventory control of AT. In addition, competent technical expertise for the maintenance of AT should be provided, given that health professionals want to provide safe products. Some participants, especially occupational therapists, mentioned that they will not recycle until they receive some support from their working environment.

Perception on incentives for management. Regarding incentives for management, there are many things that can be done. The health ministry and other ministries must play a substantial role in terms of fostering an ethos of recycling among health care providers and insurers. In order to encourage recycling, health insurers and other public payers should require companies to submit products that meet recycling criteria. Governments should heighten awareness of the consequences of not recycling and provide incentives for recycling.

Discussion
This discussion centres around the responses to the three research questions in the study with a particular focus on the responses from occupational therapists: 1) What were the respondents’ experience with recycling AT? 2) What are the factors that could contribute to the successful implementation of a policy of recycling AT? 3) What are the advantages and disadvantages of recycling?

What were the respondents experience with recycling AT?
Occupational therapists reported mixed experiences with recycling. A positive experience was reported in cases 2, 3, and 5. The three occupational therapists were supported by their employers with both personnel and materials. The employer in a community health centre was supported financially by the provincial health care authorities in the region. In addition, these occupational therapists stressed that other clinicians involved in the recycling process had well defined roles and responsibilities. The occupational therapist could act as a coordinator, trainer, consultant and advocate for recycling. Therefore, drawing upon the theoretical framework proposed in Figure 1, the satisfaction of the occupational therapist is attributable to the implementation of incentives for professionals. Also, the bureaucratic element was important which helped define the roles and responsibilities of various clinicians. Finally, their satisfaction was also attributable to harmonious relationships which were established with commercial partners and payers (i.e., institutions which buy recycled wheelchairs). There were no political or formal technocratic strategies (norms, laws, standards) that were employed in recycling. The practice of recycling in all cases was very different.

The experience of three participants in industry was positive in cases 1, 2 and 5. Satisfaction with recycling was attributable to the feasibility of recycling procedures established with clinical partners. The companies recycled AT in a way that met standards that were clinically acceptable (including hygienic standards). According to the model of regulation, industry was compliant with commercial and bureaucratic philosophies (to have the demand for recycling come from the clinical setting). No other philosophy in the model was drawn upon by the commercial sector.

Finally, the experience of two users in the second case was not satisfactory. They were not satisfied by the length of time it took to get AT. According to the model of regulation, the consumers were satisfied with recycling according to professional philosophy (response to client needs) and also according to market reasoning (recycled AT can be more economical).

The experiences of five occupational therapists in the fourth case and for two community health centres in case five, were negative. The occupational therapists did not have the support of their employer and colleagues for recycling. The tasks involved in recycling were not shared and the occupational therapists inherited the tasks of manager, cleaner, repairman, receptionist and delivery person of recycled AT.

It appeared that the recycling experiences were negotiated among the diverse group of players presented in the model of regulation. In addition, the experiences seemed satisfactory.
from the point of view of those participating in the study. The fact that several recycling practices were judged as satisfactory by occupational therapists, is not proof of the programme’s effectiveness at the provincial level. Recycling practices are extremely different from one setting to the next, the standards for recycling are not the same, and the costs are far from being consistent. One question remains: how can one judge the effectiveness and the efficiency of one mode of recycling versus another without any point of comparison and without guidelines for an ideal programme?

What are the factors that could contribute to the successful implementation of a policy of recycling AT? Table 1 presents 23 factors that could influence the implementation of a policy of recycling AT, according to the perspectives of health professionals. In total, the results of the study suggest 134 factors that could influence the success of a recycling policy (Vincent, 1997, 1998a). Each of our groups of participants (professionals, the commercial sector, consumers, government administrators) proposed solutions and criteria to implement a policy of recycling. The model of regulation originally proposed by Contrandriopoulos (1994, 1995) enabled the classification of a number of factors that should be considered in negotiating an acceptable recycling policy. The vast majority of these factors were introduced in the results section. However, many of the points that were highlighted were not taken into account in the current practice of recycling, especially with respect to political and technocratic ideology. In current practice, there is little political will, and incentives for administrators (except for those in community health centres) that manage AT programmes. There is also no leadership by payers; there are no provincial norms or laws with respect to recycling AT. Without commitment from political and bureaucratic groups, many of the factors that were identified as facilitating the implementation of a provincial policy, cannot be implemented.

What are the advantages and disadvantages of recycling? Some health professionals expressed the opinion that recycling AT is advantageous because it facilitates the evaluation of their interventions. When revisiting a client to recover an AT, health professionals often learn which ones are used, useful, not used or rejected. This presents an opportunity to assess user satisfaction and obtain overall feedback. The central equipment pools that store AT provide opportunities for occupational therapists to a) compare products b) educate other professionals about AT and c) provide client education prior to dispensing AT. The practice of reusing AT works best for the clinician when this process is well established and clearly laid out in the work environment. When this is the case, occupational therapists can more readily provide AT, ensure equipment safety, and offer the same professional services as with new AT.

Occupational therapists reported that recycling was negative when clear cut policies or guidelines were not in place particularly if the responsibility was delegated to one person. When this was the case, occupational therapists reported feeling discouraged, less efficient and ineffective. This was particularly true when the occupational therapist did not know how to assess and address durability, safety, mechanical, electrical and electronic problems. Participants reported other negative aspects of recycling. For example, when the management of the recycling programme was not well established, there were also ethical concerns of professionals about the process, such as ensuring safety, the monitoring of adequate maintenance and the provision of clean and sterile products. There were also concerns about what one should do if a client insists on a new piece of equipment when a second hand one is available.

There are other major points to consider in deciding whether a recycling of AT policy is plausible: one must establish collaboration between the different sectors or groups with influence and thus favor integrated and intersectoral regulation. The model of adapted regulation of Contrandriopoulos (1994, 1995) is important to consider. Nevertheless, it is necessary to integrate the pluralism that emerged from these results, that is, the fact that many sectors have different perspectives regarding the conditions for the implementation of a recycling policy. From then on, the participation of users at the level of establishing policies becomes fundamental in order to legitimize this new practice of recycling, on the condition that these policies do in fact promise greater accessibility to AT. Incorporating user satisfaction towards AT maximizes the importance of participation of the community sector. Equally important is the participation of experts in the industrial sector to design recyclable products that are more comfortable, portable, easily repaired, adjustable, solid, light, easy to use, efficacious and comparable from one generation of products to another. In integrating the industrial sector in the conceptual model, one therefore accentuates the importance of maintaining the ideologies of eco-design.

Conclusion

This article describes the positions of various players potentially affected by the recycling of AT in Quebec. This is also the first research project that considers all the different points of view on recycling AT. It presents more than eight different points of view which can be classified under professional, commercial, technocratic and political perspectives. It is interesting to note that the development of one policy of recycling AT takes into account the process of negotiation between many players who have different beliefs and value systems, according to the position they occupy in the field of AT. This article presents different points of view from varying sectors: the commercial, health and community sector. It is important to work from all the diverse positions to successfully implement a recycling policy for AT.

The strength of the study includes its content validity because of the broad range of perspectives that were considered, and the depth of the analysis of the critique. Limitations
include potential threats to external validity; only participants that are eligible for community and rehabilitation services in four large regional cities of Quebec were included. Recycling practices in hospitals or long term health centres were not studied. Future research on this subject should include participants from other regions and other programmes.

Finally, the author advocates that occupational therapists should carefully consider and take a unified position with respect to recycling depots for AT. The occupational therapist could play a key role in establishing a future policy for recycling AT and in implementing such programmes.

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References


