
Assistive Technology: a Dynamic Tool to Deal with the Changing Needs of People with Disabilities

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Due to the accelerating rate of the industry's constant innovations, more users become dependent on the most recent technology available on the market. Assistive technology is no exception, as the needs of people with disabilities are constantly changing. A retrospective transversal cohort study was designed in order to evaluate the needs of people with disabilities in relation to assistive technology, and how these needs change over time. This study compares the needs of people with disabilities over the last five years, based on the 952 participants' personal experience in the assistive technology study carried out by Puerto Rico Assistive Technology Program (PRATP) from March 2003 to March 2007. Various statistical tests were

carried out in order to determine if there is a significant difference between the reported assistive technology needs and the years of the study. Test results showed a significant statistical association between participants' knowledge level of assistive technology and the years of the study. Similarly, it showed a significant difference between the priority work areas and the years of the study. Besides, statistical associations between sectors, types of disabilities, and work priorities were established in order to determine areas of need in accordance with consumers or service providers' characteristics or particular interests.

Key words: Assistive technology, Special needs, Changing needs, Disabilities

Human nature is constantly changing (1). People's needs change according to their stage of lifespan and environment (2). Compared to the general population, the needs of people with disabilities change differently in terms of speed and context (3).

Assistive technology is the principal promoter of changes in the lives of people with disabilities (4). Counting with alternative available technologies, high or low cost, such as a simple switch, has changed the mission of people with disabilities in the society, and the vision of the community towards this sector of the population (5).

In December 1st, 1993, this program began as a project of the Disability Act of 1988 (Tech Act; PL 100-407), as amended, the Assistive Technology Act of 1998 (L.P. 103- 218) (6).

Due to the constant demand for more services, the program was institutionalized under the Law 264. Puerto Rico Assistive Technology Program, PRATP, was constituted in August 31, 2000 (7). During the public hearing process, the knowledge and experience acquired

in the assistive technology area concurred with the fact that the needs reported by both consumers and providers change over time (8).

A retrospective transversal cohort study was carried out in order to evaluate how the needs of people with disabilities change regarding this new technology discipline. The main hypothesis of this study was to determine if there is a significant statistical association between the participants' level of knowledge on assistive technology and the years of the study. This study intended to evaluate if there is a statistical associations between some of the particular characteristics of the surveyed people and the changes in the needs of the people with disabilities regarding the assistive technology from the perspective of the consumer or service provider.

Method

Participants

Consumers or service providers who participated in the needs assessment carried out by PRATP from 2003 to 2007. The study sample was composed of 952 individuals.

Instrument

A self-administrated questionnaire containing 12 reactive with sociodemographic and conceptual questions related to the identified needs of both provision and acquisition of assistive technology. This evaluation

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instrument was developed at the beginning of the Program and still retains much of its original structure. This questionnaire is used to determine the yearly needs of people with disabilities regarding assistive technology, and also to evaluate the pattern of identified needs over time. PRATP applies this instrument voluntarily to any person impacted by the program.

Procedure

A database from previous studies carried out during the time period of this research was compiled using the statistical package Epi-Info. For posterior analysis, this database was transferred to the Statistical Package for the Social Sciences, SPSS.

Data analysis

Different statistical descriptive analyses were carried out including frequency of distribution, measures of central tendency, bi-variate, and multivariate analysis. Chi-square and variance analysis were used to determine the statistical association level between variables.

Results

The study data show that 79.1% of the surveyed group was female and 20.9% was male. The average age of the participants was 35.8 years, although the age range was 21 ± 50 years (80.5%).

The sectors represented were: Educational field (47.7%), people with disabilities (15.0%), health professionals (12.2%), relatives (8.2%), parents (6.7%), service associations (4.9%) and professional associations (4.0%). On the other hand, the disabilities of the participants were: vision (19.8%), mobility (9.7%), communication (7.6%), cognitive (7.0%), and hearing (5.9%).

The term “knowledge” is defined as the persons’ perception of their ability or skill to explain the assistive technology concept. Quantitative values in an ordinal scale from 4 to 0 were assigned to the nominal values used in this instrument to describe the level of knowledge as: much, enough, regular, little and nothing.

According to McDougall (1), the greater the exposure of a population to a new concept, the greater the knowledge of this population about this innovation. The average

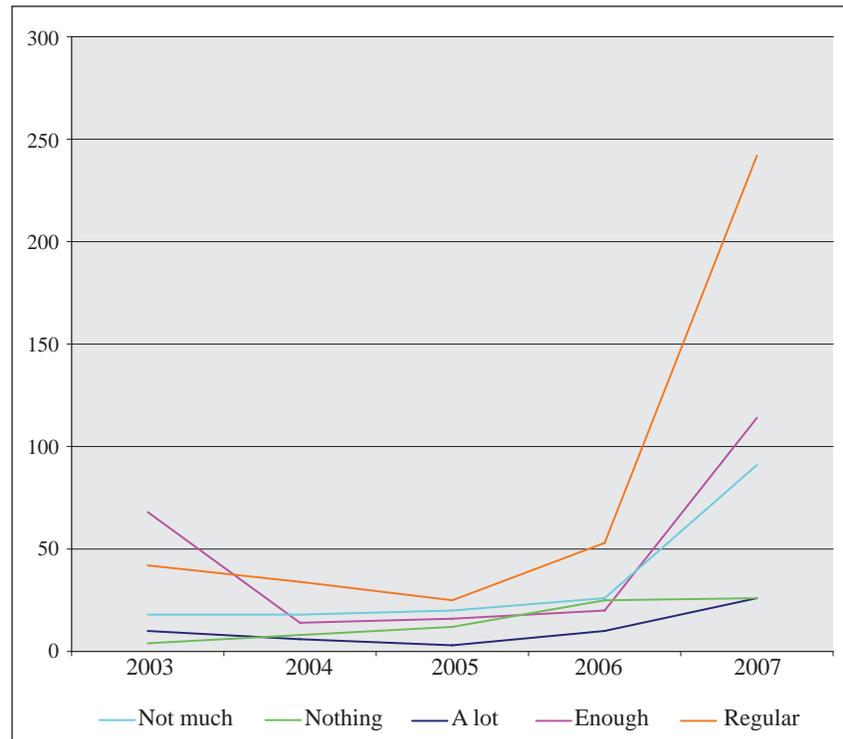


Figure 1. Knowledge Level by Years of the Study

knowledge level was estimated to be 2.05 points per person with a difference of 1.0 point. Since 2005, people began to acquire more knowledge on assistive technology (Figure 1).

About 17.1% of the group was identified as a consumer or people who represent the consumer interests. This population sector identified an average of 1.1% of the needs of the consumers surveyed: lack of trained personnel in assistive technology (65.0%), lack of financing (19.6%), and lack of assistive technology equipments (15.4%).

On the other hand, about 19.2% of the group, identified as service providers, pointed out an average of 2.6% of the needs during the assistive technology provision process. Within those needs, there is: lack of knowledge about how to train the consumers in using assistive technology equipments (52.7%), lack of knowledge about how to recommend assistive technology equipments (24.5%), and lack of knowledge about assistive technology equipments and services (10.3%).

Describing the needs of people with multiple disabilities regarding assistive technology, Petry & Maes (3) have suggested that the service provider’s fundamental task should be the search of cost-efficient alternatives to satisfy the identified needs from the perspective of the consumer and the provider.

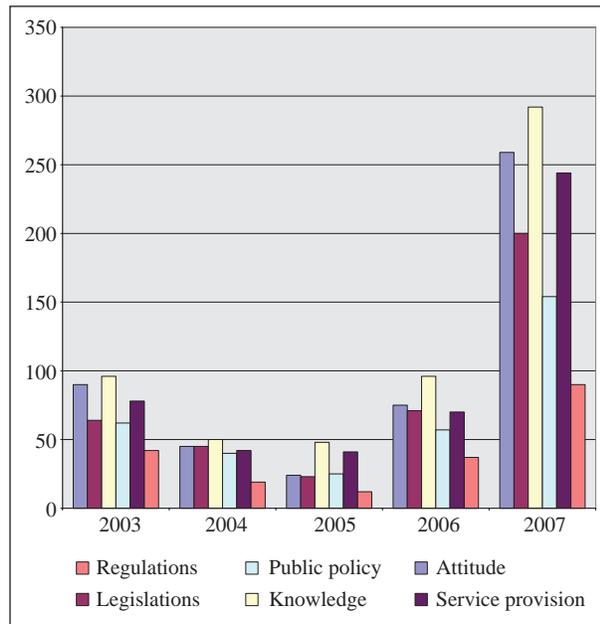


Figure 2. Work Priorities Distribution by Years of the Study

According to Wepner & Bowes (6), most of these needs can be solved when the problem is clearly defined and there are available resources to provide information about it.

Therefore, if the need is a concept that is dependent on the available information about a particular event, the results in Figure 2 validate this theory establishing the following areas as work priorities to PRATP: knowledge (23.3%), attitude (19.8%), service provision (19.1%), legislation (16.2%), public policy (13.6%), and regulations (8.0%).

Discussion

As established in the results, this study concludes that the needs of people with disabilities are constantly changing due to the amount of available information in the consumer and service provider field. According to Hinckley, Ferreira & Maree (2), the priorities of people with disabilities are as variable as their life experiences and their role in the society.

As shown in Table 1, according to the findings of this study, there is a significant statistical association between the level of knowledge in assistive technology and the years of the study ($p < .05$). As time goes on, there is an increase in the level of knowledge on assistive technology from the consumer and the service providers.

There is a significant statistical association between the following work areas and the years of the study: attitude, legislation, knowledge, public policy, and regulations ($p < .05$). This is an indication of how the level of priority of each work area described above changes over time.

On the contrary, service provision does not show a significant statistical association during the years of the study. According to the participants of the study, service provision keeps a constant level of priority (Figure 2).

According to Vanderheiden (4), if a significant statistical association can be established between the population's characteristics and their needs, then the needs may be predicted by predetermined circumstances.

An in-depth analysis of the data showed a significant statistical association between the services associations and the work areas in relation to legislation and regulations ($p < .05$). Services associations' employees tend to visualize legislation and regulations as areas of priority.

Similarly, there is significant statistical association between relatives and work areas regarding legislation, public policy, regulations, and service provision ($p < .05$). Participants' relatives consider legislation, public policy, regulations, and service provision as areas of priority.

There is a significant statistical association between the guardian or tutor group and legislation ($p < .05$). Guardians or tutors consider legislation an area of priority.

There is a significant statistical association between parents and service provision ($p < .05$). Parents consider

Table 1. Statistical Association Level between Knowledge, Work Areas, and Years of the Study

Area	Amount	Independence Grades	Average Square	Significance Level F	P
Knowledge level	44.583	4	11.146	11.728	.000
	880.029	926	.950		
	924.612	930			
Attitude	4.841	4	1.210	5.007	.001
	210.070	869	.242		
	214.912	873			
Legislation	4.664	4	1.186	4.767	.001
	212.087	867	.245		
	216.751	871			
Knowledge	2.220	4	.555	2.518	.040
	190.889	866	.220		
	193.109	870			
Public policy	4.307	4	1.007	4.606	.001
	202.679	867	.234		
	206.986	871			
Service provision	.452	4	.113	.454	.770
	215.507	866	.249		
	215.959	870			
Regulations	2.255	4	.564	3.214	.012
	151.768	865	.175		
	154.023	869			

service provision an area of priority. Similarly, there is a significant statistical association between health professional and attitude ($p < .05$). Health professionals consider the attitude towards people with disabilities an area of priority.

There is a significant statistical association between professional associations and attitude, knowledge, and service provision areas ($p < .05$). Professionals consider attitude, knowledge, and service provision as areas of priority. There is a significant statistical association between the areas of support group and public policy ($p < .05$). Support groups consider public policy an area of priority.

There is a significant statistical association between education professionals and attitude, public policy, and regulations areas ($p < .05$). Education professionals consider attitude, public policy, and regulations as areas of priority.

However, there is a significant statistical association between participants' level of knowledge on assistive technology and regulations ($p < .05$). People with extensive knowledge on assistive technology consider regulations an area of priority.

There is a significant statistical association between communication disorder and attitude, public policy, and service provision areas ($p < .05$). Participants with a communication disorder consider attitude, public policy, and service provision as areas of priority.

Finally, there is a significant statistical association between mobility disability and knowledge, public policy, service provision, and regulations areas ($p < .05$). Participants with a mobility disability consider knowledge, public policy, service provision, and regulations as areas of priority.

In conclusion, the results of this research indicate that the needs of people with disabilities regarding assistive technology change at the same time that people, circumstances, and environment do. When evaluating assistive technology needs of people with disabilities, we strongly recommend taking into consideration the environment in order to assist the need in an appropriate way.

Resumen

El ritmo acelerado de las constantes innovaciones de la industria convierten a sus usuarios en personas dependientes de la tecnología más reciente disponible en el mercado. La asistencia tecnológica no es la excepción a la regla, y como consecuencia, las necesidades de las personas con impedimentos cambian constantemente. Con el propósito de evaluar los patrones de cambios en las necesidades de las personas con impedimentos con respecto a la asistencia tecnológica a través del tiempo,

se diseñó un estudio retrospectivo de cohorte transversal. Este estudio compara las necesidades de las personas con impedimentos durante un período de tiempo de cinco años. De esta manera, se construyó una base de datos de 952 expedientes, que provenían de los archivos utilizados para realizar los estudios de necesidades correspondientes al período de tiempo de marzo de 2003 a marzo de 2007. Distintos tipos de análisis fueron realizados para evaluar si existía algún patrón de asociación significativa entre las necesidades de asistencia tecnológica identificadas y los distintos años de estudios. Los resultados de las diversas pruebas realizadas en este estudio demostraron que existe asociación estadísticamente significativa entre el nivel de conocimiento de los participantes sobre la asistencia tecnológica y el tiempo en que se realizaron los estudios. De forma similar, se encontraron diferencias significativas entre la prioridad de las áreas de trabajo y el tiempo en que se realizaron los estudios. Además, quedan establecidas diversas asociaciones estadísticas entre grupos sectoriales, tipos de impedimentos y las prioridades de trabajo con el propósito de determinar áreas de necesidades de acuerdo a características o intereses particulares de los consumidores o proveedores de servicios.

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