



## The Internet Journal of Allied Health Sciences and Practice

<http://ijahsp.nova.edu>

A Peer Reviewed Publication of the College of Allied Health & Nursing at Nova Southeastern University

*Dedicated to allied health professional practice and education*

<http://ijahsp.nova.edu> Vol.5 No. 2 ISSN 1540-580X

---

### Introduction of an Emerging Technology Device Through PowerPoint Training

---

Rebecca I. Estes, PhD, OTR, ATP<sup>1</sup>

Jimmy H. Ishee, PhD<sup>2</sup>

1. University of South Alabama
2. Texas Women's and Children's Hospital

United States

---

#### Citation:

Estes, R., Ishee, J. Introduction of an Emerging Technology Device Through PowerPoint Training. *The Internet Journal of Allied Health Sciences and Practice*. April 2007, Volume 5 Number 2.

---

#### Abstract

Successful inclusion of assistive technology in intervention is limited by training and the level of comfort with technology of treating occupational therapists. Experienced and new therapists need exposure and training on high technology assistive devices newly introduced on the market. The purpose of the study was to identify the effect of a PowerPoint presentation to introduce an emerging high technology device on two groups: 30 licensed occupational therapists and 27 students in an entry level master of occupational therapy program. The PowerPoint developed introduced and educated participants on the Assistive Dining Device. Participants completed a demographic form, the Survey of Technology Use and the Quebec User Evaluation of Satisfaction with assistive Technology. Participants also to rated their satisfaction with the information presented. Results showed 98% of the participants were satisfied with the information presented and 95% of the participants were satisfied with their acquired knowledge base to recommend the device for client use. Master of occupational therapy students were similar in personal characteristics to occupational therapists but were both more satisfied with the Assistive Dining Device characteristics and had a more positive attitude toward technology. Participants who had a less positive attitude toward technology also had a slightly lower mean satisfaction with the Assistive Dining Device than those who had a more positive attitude toward technology. PowerPoint presentations appear to be one effective means of communicating information about new technologies. Further study needs to be done to evaluate the effectiveness of similar media included in packaging and marketing of assistive technology devices.

---

#### Introduction

The escalation and development of assistive technology devices and the evolution of assistive technology as a practice area have increased the potential for greater independence and improved quality of life for persons with disabilities. However, access is often limited, due in part to the lack of awareness and lack of competency in assistive technology service provision among therapists as well as the attitudes and perceptions held by therapists and consumers regarding technology.<sup>1,4</sup> Successful incorporation of assistive technology devices into client activities of daily living depends, to some extent, on therapists' knowledge of available devices, ability to match the device and the consumer's need, and ability to provide appropriate training in device use.<sup>1,5</sup> Additionally, therapists' degree of personal comfort with technology and their attitude toward general technology use influences their willingness to incorporate higher

technology assistive devices in treatment.<sup>1</sup> The increasing number and complexity of available high technology assistive devices, both historically and currently, results in a growing disparity in practicing occupational therapists' knowledge base and ability to recommend them adequately.<sup>1,2</sup> Due to the increasing demand for assistive technology devices and services it is imperative that occupational therapists be knowledgeable about providing quality assistive technology device selection and services.

Occupational therapy professionals recognize the importance and need for assistive technology training to provide quality services to consumers.<sup>6-9</sup> While assistive technology educational modules have been increasingly included in the entry level OT curriculum, entry level therapists are only expected to have a basic knowledge of assistive technology for screening purposes and the

ability to refer out to other professionals if needed.<sup>7,9-11</sup> This basic level of assistive technology training results in inadequate skills for high technology assistive device assessment and service provision among entry level therapists. Many experienced therapists do not feel adequately prepared to provide assistive technology services due to lack of high technology assistive technology training or exposure in their educational background.<sup>6,12</sup> Practicing occupational therapists who provide assistive technology services have acquired the necessary knowledge and skills through on the job training or from continuing education.<sup>2</sup> However, there are limited offerings in assistive technology training through continuing education and these courses cannot provide the breadth of information needed, nor keep up with the wealth of new technology continually emerging. The lack of occupational therapists' advanced knowledge base in assistive technology in conjunction with technology advancements results in an ever-growing need for occupational therapists skilled in the area of assistive technology. Therapists already in the field with training in assistive technology are faced with the ongoing challenge of trying to keep abreast. When new high technology assistive devices are introduced on the market, the challenge then is twofold: how best to train therapists already in the field and how to educate new, incoming therapists. The purpose of the study was to identify the effect of a PowerPoint presentation on perceived satisfaction toward an emerging high technology device on two groups: licensed occupational therapists and students in an entry level master of occupational therapy program.

## **Methods**

### **Participants**

Participants were 30 occupational therapists attending local or state conferences for continuing education and 27 students enrolled in a course on specific tools in occupational therapy in the Master of Occupational Therapy entry level program at Texas Woman's University. All master of occupational therapy student data were used in the study, except from one student whose data set was incomplete. The in-service training offered was available to all attendees at each conference; therefore, it was not possible to limit the presentation to only occupational therapists. Participants indicated their consent to be included in the study by completing and returning the questionnaires. In-service attendees' data were eliminated if they were certified occupational therapy assistants (10), physical therapists (1), master of occupational therapy students (2), or if there were incomplete data sets (1).

### **Procedures**

Stage one of the study involved the development of a PowerPoint presentation for in-service training designed to introduce and educate therapists on the Assistive Dining Device ([www.mealtimepartners.com](http://www.mealtimepartners.com)). The 50 minute presentation included a description of the dining device as well as its physical features and specialized

design, use of adaptive switches for control, explanation of the control panel for adjustments to meet specific consumer needs, methods of food preparation for serving in the Assistive Dining Device and identification of appropriate consumer populations. Additionally, the presentation included video clips of consumers using the dining device. The study was reviewed and approved for conduct by Texas Woman's University Institutional Review Board prior to initiation of the second stage.

The second stage of the study involved presentation of the 50 minute PowerPoint in-service to the participants. At the beginning of the in-service participants were asked to fill out a demographic form and the Survey of Technology Use which was used to collect data on the participants' comfort and success level with general technology use.<sup>13</sup> General technology refers to technologies available in everyday use, such as DVDs, computers, ATM machines, personal digital assistants, etc. Following the completion of the Survey of Technology Use, the PowerPoint in-service was presented. At the end of the in-service participants completed the Quebec User Evaluation of Satisfaction with assistive Technology.<sup>14</sup> This survey was used to collect data on participants' perceived satisfaction with the dining device characteristics. Additionally, participants were asked to rate their satisfaction with the in-service information presented on the device (procedures, length of time, overall content) and satisfaction with the knowledge base acquired to provide professional services (information and training) on the dining device.

### **Assistive Dining Device**

The Assistive Dining Device, developed by Mealtime Partners Incorporated, facilitates independence in eating and allows the user control of their food consumption at mealtime with minimal to no use of the arms or hands during operation (see Figure 1). It was designed to meet the needs of individuals with a variety of physical and cognitive disabilities. When the Assistive Dining Device was ready to be introduced to the commercial market the challenge arose of how to educate therapists about it in order for appropriate recommendations to occur. As this is a relatively high technology device, it seemed an optimal opportunity for further research into the exposure and training of professionals since the acceptance of the Assistive Dining Device among practicing therapists could influence consumer's access to the product.

### **Survey of Technology Use**

The Survey of Technology Use is part of the Matching Persons and Technology array of assessment tools.<sup>13</sup> The Survey of Technology Use measures a client's level of comfort and success in the use of technology. The survey is divided into 5 sections: 1) listing of frequently used technologies, 2) experience with current technology, 3) perspectives of technology, 4) typical activity involvement, and 5) personal and social characteristics. Sections 2 through 5 are rated on a three

point scale, 1) positive, 2) neutral, and 3) negative, with the employment of polar adjectives. Stability was established over a four month period with a population of music undergraduates; and content validity is based on creation of items from experiences of people who used

or did not use technology provided to them.<sup>13</sup> The Survey of Technology Use was completed at the beginning of the in-service sessions to collect data on therapists' and students' level of comfort with general technology.

Figure 1. Assistive Device



The Survey of Technology Use is scored by totaling the number of responses (positive, neutral and negative) for each category, then summing the categories for overall totals. The first two scored categories focus on attitude toward technology use with positive scores indicating more comfort and negative scores indicating discomfort with technology use. The last two categories describe the individual, the general affect, mood and typical activities which have an effect on a person's perspective on technology.<sup>13</sup> For the purposes of this study, the groups were compared on measures of positive predisposition to general technology use in the two categories, attitude toward technology and perspectives on technology.

#### **Quebec User Evaluation of Satisfaction with Assistive Technology**

The Quebec User Evaluation of Satisfaction with assistive Technology is a 12 question client rated survey of satisfaction with an assistive technology device.<sup>14</sup> Participants rate satisfaction with assistive devices and services on a 5 point Likert scale ranging from not satisfied at all to very satisfied. The category of assistive device satisfaction includes the rating of dimensions, weight, ease of adjustment, safety/security, durability, ease of use, comfort, and effectiveness. The category of services includes rating satisfaction with repairs and service support, and follow-up services available for the device. The intended Quebec User Evaluation of Satisfaction with assistive Technology audiences is clients; however, therapists were asked to respond to the

questions, at the conclusion of the in-service, from the perspective of potentially prescribing therapists.

The Quebec User Evaluation of Satisfaction with assistive Technology produces two sub-scores (device and services) and a total score. Scores are calculated by summing the values marked (scale of 1-5), then dividing the sum by the number of valid responses. Subscale scores are used to evaluate the consumer's satisfaction with the device and satisfaction with services provided for the device. The 'total' score is suggested for use when examining the relationship between overall satisfaction and other outcomes measures.<sup>14</sup> Test-retest reliability was evaluated in a study of 139 participants. All Quebec User Evaluation of Satisfaction with assistive Technology items had stability coefficients at the moderate or substantial level (.51 - .74). Internal consistency coefficients were acceptable for the Quebec User Evaluation of Satisfaction with assistive Technology device subscale ( $\alpha = .80$ ), the service subscale ( $\alpha = .76$ ) and the total scale ( $\alpha = .80$ ). The authors cite research findings to support test validity as well.<sup>14</sup> The total score, representing the overall satisfaction of therapists and students with the Assistive Dining Device was used in data analysis.

#### **In-Service Satisfaction Questions**

In addition to the above tools, two questions were asked to gain information on therapists' and student's perceptions of the exposure and training module on the Assistive Dining Device. Questions were posed in a format similar to the Quebec User Evaluation of

Satisfaction with assistive Technology, rating satisfaction on a scale of 1-5. At the end of the in-service, along with the Quebec User Evaluation of Satisfaction with assistive Technology, participants were asked how satisfied they were with the in-service information presented (procedures, length of time, overall content) and the knowledge base gained through the in-service to provide professional services (information and training) for the device.

### Results

Data collected on participant perception of the PowerPoint in-service on the Assistive Dining Device as an effective means of training were analyzed by calculating percentage of levels of satisfaction ratings; data on the perceived level of satisfaction with the knowledge base gained through in-service training was analyzed in the same manner.

The perceived level of satisfaction with Assistive Dining Device device characteristics (Quebec User Evaluation of Satisfaction with assistive Technology scores) of practicing occupational therapists was compared to that of entry level occupational therapy students through use of an independent samples *t*-test. A MANOVA was conducted to determine if there was a difference between groups on attitude toward technology and perspective of technology. Finally, the effect of attitude toward technology on the level of satisfaction with Assistive Dining Device device characteristics was explored by dividing participants into two groups. The 50<sup>th</sup> percentile was used as the cutoff score to assign participants to groups. This resulted in participants with a score  $\geq 9$  (out of 13 on the Survey of Technology Use sections for attitude toward technology) being assigned to the group designated as having a more positive attitude toward technology; participants with a score  $\leq 8$

were assigned to the group designated as having a less positive attitude toward technology. An independent samples *t*-test was then conducted to compare the level of satisfaction with the Assistive Dining Device device characteristics.

### Participant Demographics

Specific participant demographics are presented in Table 1. The majority of participants were female while most master of occupational therapy students were between 18 – 29 years, and most practicing occupational therapists were between 24 – 35 years old. The majority of practicing occupational therapists was trained at the bachelor's level and had not earned a higher degree while the students were all enrolled in an entry level master of occupational therapy program. Demographic information on practice areas and experience are presented only on the practicing therapist group as the master of occupational therapy students were still in the academic portion of their training and had no established practice area or experience in service provision. The majority of OT participants worked in the areas of education (26%), gerontology (23%) or physical disabilities (23%). One third of the participants had practiced from 1 to 5 years, one third had practiced from 6 to 20 years and one third had practiced for more than 20 years. Of the practicing occupational therapists, 5 had no training in assistive technology, 19 had 1-3 in-service training experiences and 7 had 4-6 in-service training experiences; no participants identified themselves as assistive technology practitioners. The majority of therapists ( $n=16$ ) indicated that they had no assistive technology service provision experience, 10 indicated 1 to 2 years of experience, 4 had 6 or more years of experience and one participant did not respond to the question.

**Table 1: Participant Demographic Data**

Demographic Categories		OTs	MOT Students	Category Totals
Gender	Male	2	2	4
	Female	28	25	54
Age in years	18-23	0	11	11
	24-29	8	14	22
	30-35	8	0	9
	36-41	1	1	2
	42-47	4	1	5
	48-53	6	0	6
	54+	4	0	4
Highest degree earned	BS	17	0	17
	MOT	6	27	6
	MA/MS	6	0	6
	PhD	2	0	2
Total		31	27	58

*Note.* All MOT student participants are listed in the MOT degree category although they were still in the academic program at the time of study participation. OTs are occupational therapists; MOT is master of occupational therapy.

### Perception of PowerPoint In-Service

Participants were asked how satisfied they were with the in-service information provided (procedures, length and overall content) on the Assistive Dining Device. Sixty-six percent rated their satisfaction with the in-service as very satisfied, 31% rated their satisfaction as quite satisfied and only 2% rated their satisfaction as more or less satisfied or not very satisfied, no participants rated it as not satisfied at all. Participants were also asked to rate their satisfaction with the knowledge base acquired through the in-service to be able to provide professional services (information and training) to clients for the Assistive Dining Device. Twenty-four percent of the participants rated their satisfaction with the knowledge base acquired as very satisfactory, 47% rated it quite satisfactory, 24% more or less satisfactory and only 5% as not very satisfactory and no participants rated it as not satisfied at all. The desire for hands-on experience with the device was the most common comment. Results showed 98% of the participants were satisfied (rating of 3 and above) with the in-service material presented and 95% of the participants were satisfied with their acquired knowledge base to recommend the device for client use. Based on these results, the introduction of the Assistive Dining Device as a new assistive technology device through PowerPoint presentations appeared to be a viable method.

#### **Levels of Satisfaction with the Assistive Dining Device and Comfort with Technology Use**

There was a significant effect for group,  $t_{(56)} = 3.62, p < .001$ , with entry level occupational therapy students rating their satisfaction level higher than practicing occupational therapists on the Quebec User Evaluation of Satisfaction with assistive Technology. The MANOVA identified a significant difference ( $\text{Lambda}_{(2,54)} = .85, p < .05$ ) between groups on attitude toward technology and perspectives of technology (Survey of Technology Use scores). Follow-up univariate ANOVAs indicated that the Survey of Technology Use section measure of perspectives of technology, described by the authors as measures of personal characteristics, were not significantly different between groups ( $F_{(1,55)} = .63, p > .05$ ). Attitude toward technology, however, was significantly different ( $F_{(1,55)} = 9.44, p < .01$ ), with master of occupational therapy students having a more positive attitude toward technology than practicing therapists. Based on these results, the entry level master of occupational therapy students were similar in personal characteristics to the practicing therapists (ANOVA) but were both more satisfied with the Assistive Dining Device characteristics ( $t$ -test) and had a more positive attitude toward technology (ANOVA).

To compare attitude toward technology (Survey of Technology Use scores) and satisfaction with Assistive Dining Device characteristics (Quebec User Evaluation of Satisfaction with assistive Technology scores) we divided the participants into two new groups, those who had a more positive attitude toward technology and those who had a less positive attitude toward technology. Participants designated as having a more positive attitude toward technology scored  $\geq 9$  on the Survey of Technology Use sections for attitude toward technology, while the group with a less positive attitude toward technology scored  $\leq 8$ . The  $t$ -test results showed no significant differences between the two groups,  $t_{(54)} = .93, p > .05$ ; however, those who had a less positive attitude toward technology also had a slightly lower mean satisfaction with the Assistive Dining Device ( $M = 33.85$ ) than those who had a more positive attitude toward technology ( $M = 34.87$ ).

#### **Limitations**

Participation in the study was voluntary and delimited to therapists electing to attend the offered continuing education workshop and students enrolled in the master of occupational therapy program at TWU. Also, the use of a PowerPoint presentation was used as the method of training; alternative types of training might have produced equal or better results. This study used measures of perceived satisfaction to evaluate participant response to the in-service as well as to the Assistive Dining Device. This is a limitation due to the subjectivity of the assessment and level of evidence provided by the instrument. Additional limitations to this study that could be addressed in future studies include using a broader population sampling, multiple training approaches, random assignment of participants to groups, and a follow-up survey to study the impact of training on future intervention strategies.

#### **Discussion**

In our increasingly technology dependent world, it is important for occupational therapists practicing in the area of assistive technology to keep abreast of new developments. The American Occupational Therapy Association's 2004 statement on assistive technology in occupational therapy practice encourages the use of assistive technologies in intervention to optimize client independence and occupational performance.<sup>7</sup> Additionally, occupational therapists are expected to provide a broad range of services (evaluation, recommendation, advocacy, training, etc.) in a variety of settings.<sup>7</sup> Thus, there is a need to find the most effective means of communicating about how to use and prescribe new devices as well as a need to make therapists comfortable with the use of high tech devices so they can support the widest options available to their clients. This should create the greatest potential for effective and efficient use of assistive technologies in adaptive strategies to increase client independence in activities of daily living.<sup>1,7,15</sup> Although the Assistive Dining Device is covered under a Medicare code for mechanical feeding devices, other high technology devices not considered as durable medical equipment, orthotics or prosthetics may not be covered.<sup>16</sup> Therapists also need to become familiar with alternative payor sources such as the family, community organizations and state assistive technology programs.<sup>16</sup>

Master of occupational therapy students in the study rated themselves more comfortable with general technology use than occupational therapists. The reason why master of occupational therapy students were more comfortable is unknown but it

might be hypothesized that it is due to their youth as 93% of the student group was between the ages of 18-29 years while the 74% of the occupational therapists were 30 years or older. Therapists who are members of a generation that has grown up with technology and computers may have a greater degree of comfort naturally but they also are more likely to have received technology training in school than older therapists.<sup>1,2,9</sup> For whatever reason, this may be a good sign for newer therapists' future ability to accept and incorporate assistive technology in practice. However, the need to find a way to increase the comfort level of experienced practicing therapists continues. The need for effective ways to inform new entry level therapists about emerging technology continues. The use of a PowerPoint presentation appears to be one effective means of communicating information about new technologies. As discussed above, further research needs to be done to evaluate different types of training, the effectiveness of similar media included in packaging and marketing of assistive technology devices and the impact of training on therapists' intervention strategies.

## References

1. Fifield, M. B & Fifield, M. G. (1997). Education and training of individual involved in delivery of assistive technology. *Technology and Disability*, 6 (2), 77-88.
2. Gitlow, L. & Sanford, T. (2003). Assistive technology education needs of allied health professionals in a rural state. *Journal of Allied Health*, 32 (1), 46-51.
3. Hocking, C. (1999). Function or feelings: factors in abandonment of assistive devices. *Technology and Disability*, 11, 3-11.
4. Riemer-Reiss, M. L., & Wacker, R. R. (2000). Factors associated with assistive technology discontinuance among individuals with disabilities. *Journal of Rehabilitation*, 66, 44-50.
5. Copley, J., & Ziviani, J. (2004). Barriers to the use of assistive technology for children with multiple disabilities. *Occupational Therapy International*, 11(4), 229-243.
6. Angelo, J., Buning, M. E., Schmeler, M., & Doster, S. (1997). Identifying best practice in the occupational therapy assistive technology evaluation: An analysis of three focus groups. *American Journal of Occupational Therapy*, 51(10), 916-920.
7. American Occupational Therapy Association (AOTA). (2004). Assistive technology within occupational therapy practice. *The American Journal of Occupational Therapy*, 58(6), 678-680.
8. Breines, E. B. (2002). Occupational therapy in a technological world. *American Journal of Occupational Therapy*, 56(4), 467-469.
9. Kanny, E. M. & Anson, D. K. (1998). Current trends in assistive technology education in entry-level occupational therapy curricula. *The American Journal of Occupational Therapy*, 52 (7), 586-591.
10. Bain, B. K. (1996). Pioneering assistive technology education at New York University. *Technology Special Interest Section Newsletter*, 6(3), 1-2.
11. Cunningham, R. & Kalscheur, J. (2002). Service-learning in assistive technology: A win-win experience for occupational therapy students and community partners. *Technology Special Interest Section Newsletter*, 12(4), 1-4.
12. Lenker, J. A. (1998). Professional education programs in rehabilitation engineering and assistive technology. *Technology and Disability*, 9, 37-48.
13. Scherer, M. J. (1998). *Matching Persons to Technology*. Institute for Matching Persons and Technology: Webster, NY.
14. Demers, L., Weiss-Lambrou, R., & Ska, B. (2000). *Quebec User Evaluation of Satisfaction with assistive Technology, version 2.0*. The Institute for Matching Persons and Technology: Webster, NY.
15. Hammel, J. M. & Smith, R. O (1993). The development of technology competencies and training guidelines for occupational therapists. *The American Journal of Occupational Therapy*, 47(11), 970-979.
16. Brachtesende, A. Helping clients obtain funding for assistive technology. *OT Practice*. (2003, May 05). Retrieved December 18, 2006, from <http://www.aota.org/featured/area3/links/f-050503.asp>