The Development of Technology Competencies and Training Guidelines for Occupational Therapists

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Key Words: education, occupational therapy

The ability to use technology has become a survival skill in our society. This paper discusses technology trends related to the demands of the Information Age, the increasing availability of information and assistive technologies, and the impact of recent civil rights legislation mandating that persons with disabilities be given equal access to technologies that can enhance functional performance. Occupational therapists must become competent in the application and integration of these technologies into reasonable accommodation interventions if we are to meet the changing needs of persons with disabilities. To address this need for technology training, a multitiered set of technology competencies specifically designed for occupational therapy practitioners was authored by the American Occupational Therapy Association Technology Special Interest Section and reviewed by occupational therapists with technology expertise. The process of developing these competencies and recommendations for implementing them within occupational therapy educational programs are discussed.

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Occupational therapists have long been using and incorporating technologies as a means of improving functional performance of persons with disabilities. Adaptive devices, jigs, splints, and utensil holders have been used as assistive tools to aid in returning clients to independent living in the community, to promote equal social status and access to competitive employment, and to improve overall quality of life. Over the past decade, however, the number and sophistication of technologies have increased. We have observed three trends in technology that will affect occupational therapists.

Technology Trends

Information Age

Our society is immersed in an Information Age (Naisbitt & Aburdene, 1990; Toffler, 1981) in which information technologies are commonplace in virtually every setting including the home, school, work, and recreational environments. Persons are required to access and use many technologies, such as computers and fax machines, daily. Once the slide rule was a commonly seen educational tool in high schools; now calculators are a standard tool for grade school instruction. Eventually, the calculator will be replaced by portable, hand-held computer systems that offer access not only to sophisticated computations, but also to information and resources from around the world. The ability to access and use information technologies has become a survival skill for every member of society and should therefore be considered part of meaningful activity and human occupation.

Assistive Technologies

Assistive and rehabilitative technologies designed for persons with disabilities are becoming increasingly prevalent, functional, affordable, and sophisticated. Publications on the topics of adaptive computer access technology and assistive technology have increased in occupational therapy literature (Angelo & Smith, 1993; Church & Glennen, 1992; Hedman, 1990; Mann & Lane, 1991; Smith, 1992a; TrefJer, 1987). Ten years ago, the choices of assistive technology were limited and persons with disabilities had to adapt to whatever was available. Today, there is an increasing range and level of sophistication of technologies from which to choose; persons with disabilities can customize and integrate many technologies to fit their specific needs and life goals. The HyperABLEDATA catalog lists more than 15,000 products (Trace Center, 1992). A series of Tech Use Guides and training materials regarding the use of computer technology specifically describes the role of the occupational therapist in assistive technology service provision with persons with disabilities (Center for Special Education Technology, 1991b).
Legislation

A grass-roots movement among persons with disabilities has resulted in key pieces of legislation as well as shifts in how society interacts with and incorporates persons with disabilities (Fine & Asch, 1988). Key legislation, such as the Americans with Disabilities Act of 1990 (Public Law 101-364), the Technology-Related Assistance for Individuals with Disabilities Act of 1988 (Public Law 100-407), the Rehabilitation Act of 1973 (Public Law 93-112) and its Amendments of 1986 (Public Law 99-506), and the Individuals with Disabilities Education Act of 1990 (Public Law 101-476), mandate that children and adults with disabilities be given equal access to control, mobility, and communication technologies that enable them to function as independently as possible in the community, school, and workplace. However, there is a gap between legislation and implementation of these rights. Funds are needed both to provide the technology and to train personnel; federal agencies have been charged to close this gap. Commissions at federal, state, and local social service agencies that fund services, equipment, and research for persons with disabilities have integrated wording into the regulatory documents emphasizing the use of assistive and rehabilitative technology.

Service Provision

The increased use of technology has introduced emerging areas of service provision in which occupational therapists can become or are involved, including adaptive computer access assessment, ergonomic analysis, and worksite accommodation, to name only a few. This trend requires therapists to provide services to schools, worksites, and communities. Other areas in which occupational therapists have traditionally been involved, such as seating, positioning, and mobility, have become increasingly specialized. Therapists must now be competent in working within an interdisciplinary service provision team that may include physical therapists, speech and language pathologists, rehabilitation professionals (e.g., physicians, nurses, psychologists, and social workers), engineers, educators, rehabilitation counselors, employers, rehabilitation technology suppliers, and representatives from reimbursement sources. Therapists also now function as consumer advocates who ensure access to and funding for enabling technologies.

Occupational therapists have been using and will continue to use technology as part of their functional approach to treatment (Pedretti et al., 1992). Due to the lack of education in this area, however, many occupational therapists are not skilled in or aware of the role they can play in the application of technology, especially within an interdisciplinary service provision team. Additionally, other service providers are rapidly implementing technologies in their practices without an awareness of the potential roles for occupational therapists in this area.

These trends demonstrate the pervasive influence of technology in society and the need for occupational therapists and all rehabilitation professionals to be knowledgeable in its application. Access to technology has become as critical a need for persons with disabilities as is access to the physical environment. Therapists must be aware of and competent in the evaluation, prescription, operation, and adaptation of these technologies in order to meet the changing need of persons with disabilities.

Status of Technology Training

Technology Training Efforts in Related Fields

Several rehabilitation professions are developing technology training guidelines and certification competencies. Their efforts can offer insights into the process. These professions include special education (Center for Special Education Technology, 1991a, 1991b, 1991c; COMPUTE, 1991); general education at the elementary, high school, vocational-technical, and university levels; speech and language pathology (Blackstone & Cassatt-James, 1988); nursing; and engineering (Warren, 1992). All have named occupational therapists as critical members of the technology service provision team. Additionally, interdisciplinary groups and agencies, such as Closing the Gap, United Cerebral Palsy Association, and Easter Seals Society are also developing technology competencies and training materials that can be adapted and used by occupational therapy programs. RESNA: An Interdisciplinary Association for the Advancement of Rehabilitation and Assistive Technologies is developing competencies as part of its mandate for quality assurance and has formed a task force to produce a list of minimum competencies for a cross-disciplinary, national rehabilitation technology certification exam (RESNA, in press; Warren, 1992). Meanwhile, the American Occupational Therapy Association (AOTA) Technology Special Interest Section (SIS) Standing Committee has created a complementary set of technology competencies for occupational therapists that tap into their educational background, experience, and relevant skills.

Occupational Therapy Technology Training

AOTA has stressed the development of technology competence among its members. In the 1989–1991 Strategic Plans (AOTA, 1989–1991), technology training and dissemination were identified as primary goals. AOTA also sponsored a textbook on assistive technology and occupational therapy (Mann & Lane, 1991). Several information packets on seating and wheeled mobility, prosthetics and orthotics, rehabilitation technology, and computer access are available to AOTA members. A manifestation of the need for technology information and training among occupational therapists was the acceptance in April 1991 of the Technology SIS as one of nine AOTA special interest sections. The main goal of the Technology SIS is to
serve as a clearinghouse of technology-related information and expertise, with a focus on providing resources for therapists who are new to the use of advanced technologies in occupational therapy.

Among occupational therapy educational programs, the number offering special certifications and advanced degrees emphasizing technology is increasing, along with the number interested in developing or revising curricula to better accommodate and integrate technology into their course work (Smith, 1992b). The TechSpec program at the University of Wisconsin–Madison, one of the few formal technology specialty programs for occupational therapy students, reported that more than 450 reprints of curriculum guides were disseminated to curricula from 1988 to 1992, with many programs indicating that they were using parts of the materials to improve their related courses (Trace Center, in press). Despite this increase, to date there are no formal guidelines for the development of technology specialty programs and no consistent set of competencies for graduates of these programs (Anson, Kanny, & Smith, 1991). Instead, the curricula are based on the philosophy of the educational programs, the resources available, and the background and expertise of the faculty providing the training.

Need for Technology Training

Recent surveys of occupational therapists have studied the need for technology training (Kanny, Anson, & Smith, 1992; Somerville, Wilson, Shanfield, & Mack, 1990). When Somerville et al. surveyed 2,481 general occupational therapists and occupational therapists with expertise in technology, 69% indicated that they had recommended technology for clients. When respondents were asked about the perceived gaps between competencies seen in technology training programs (51%), and of faculty with technology expertise (65%), of developed training materials (65%), of models of technology training programs (51%), and of faculty interest (24%). Student interest was cited by only 5% of the respondents as a barrier to training.

A 1985 to 1991 longitudinal study performed at the University of Wisconsin–Madison surveyed clinical field work supervisors in occupational therapy on desired versus observed technology-related competencies of new occupational therapy graduates (Smith, 1993). The survey revealed a large gap between competencies seen and competencies desired across 30 categories of technology application. The results of this and other studies (Kanny et al., 1992; Somerville et al., 1990) point to the intense need for education in technology application. Somerville et al. (1990) summed it up well:

Even though assistive technology has great potential for improving the quality of life for individuals with disabilities, it is frequently not used in solving their functional problems or is improperly applied. A major reason for this is a lack of trained professionals to provide assistive technology services. (p. 41)

To provide this training, core technology competencies for occupational therapists must be developed.

Approach

The AOTA Technology SIS Standing Committee met to define the issues involved and the information needed in developing a core set of technology competencies for occupational therapy practitioners. Existing technology competency drafts and technology training materials were reviewed to evaluate their quality and applicability to the current Technology SIS efforts. The primary factors identified were determination of when the training should be offered, definitions of technology-related terminology, the content and methods of training, the scope of the training, and the knowledge and skill necessary for each level of competency. As defined by Crist (1993), a competency is

a statement of expected behavioral performance ... both the frequency and the quality of performance are observed and assessed. Competent performance results from the student's selection among alternatives, based on accumulation of knowledge, selection of a wise choice, and judicious application of developing clinical skills. (p. 3)

Types of Education

There are two basic areas of education for occupational therapists: preservice (undergraduate and graduate), which is typically given in an academic setting, and inservice continuing education, which is given after the occupational therapist has entered professional practice. In-
service education can be performed in a variety of settings and with many teaching methodologies.

On a preservice level, several university occupational therapy programs have been implementing technology education. In the process, they have examined such questions as:

- Should technology classes be taught on an undergraduate or graduate level?
- Should technology classes be offered as separate classes or as content integrated within all required classes?
- Should occupational therapists receive technology certification? If so, what requirements should be involved in certification (e.g., clerkships, internships, and years of inservice practice)? (Anson et al., 1991; Smith, 1992b)

In Kanny et al.'s survey (1992), the majority of the respondents thought an introduction to high-technology content should be taught in entry-level programs (88%) and specialized skills should be taught in inservice continuing education programs (78%).

The Technology SIS adopted the perspective that all occupational therapists should know about technology applications within a functional perspective at a minimum level to be achieved during preservice training, or through inservice training for practicing therapists. Content related to technology should be integrated into all required occupational therapy courses, in addition to one or more required courses that focus on the types and purposes of technologies and methods for evaluation, problem solving, integration, and funding and reimbursement. Therapists who are already practicing should attend continuing education workshops and institutes, such as "Adding Assistive Technology to Your Bag of Tricks." Therapists who use technology frequently should be competent at a higher level, particularly those who perform technology assessments. This type of expertise can only be gained through direct practice and experience with additional continuing education in the inservice level.

The Technology SIS chose to draft competencies for preservice training programs first, to provide a model set as well as guidelines for the growing number of technology training programs being developed within existing preservice occupational therapy programs.

Definitions

The AOTA White Paper Occupational Therapy and Assistive Technology (AOTA, 1991) used the federal definitions of assistive technology devices and assistive technology services. As stated in the Technology-Related Assistance for Individuals with Disabilities Act of 1988 (Public Law 100-407), assistive technology devices are defined as "any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities" (Sec. 3).

An assistive technology service is defined as "any service that directly assists an individual with a disability in the selection, acquisition, or use of an assistive technology device" (Sec. 3). These services may include functional evaluation, equipment procurement, equipment adaptation and fitting, service coordination, and training for the client, family, and other rehabilitation professionals, all of which fall into the professional duties of occupational therapists.

In their survey of technology training needs, Somerville et al. (1990) provided a glossary of terms related to technology. Technology was defined as "hardware, devices and software used to solve practical tasks and problems. Technology can range from simple mechanical devices such as reachers to complex computer or electronic equipment" (Somerville et al., 1990, p. 44). Kanny et al. delineated high technologies "by their use of electronics or by complexity of fabrication" (1992, p. 2).

Smith (1992a) distinguished between Support of Therapy and Direct Therapeutic Intervention technologies. Support of Therapy technologies are used for administrative, research, educational, and documentation tasks. The goal of Direct Therapeutic Intervention technologies is to directly increase the intrinsic function of a person or the environment. Within the therapeutic technologies, Smith delineated between rehabilitative and educational technologies (used to remediate function, e.g., cognitive retraining software and biofeedback), and assistive and adaptive technologies (used to supplement or substitute for lack of intrinsic function with a person or environment, e.g., augmentative communication, wheelchairs, and adaptive computer access devices).

For the purposes of the Technology SIS competencies, the AOTA and federal definitions of assistive technology are used to describe the scope of competencies. The specific delineations between supportive and direct therapeutic technologies are retained only in the context of the areas of technology content to be taught.

Content

Many taxonomies of technology exist. Traditionally, the major categories of Mobility, Communication, and Control have been used. These categories refer primarily to technologies as they relate to functional performance among persons with disabilities and do not reflect the vast technology applications related to assessment and evaluation, administration, education and training, and personal productivity.

To organize the myriad technologies occupational therapists could be involved in using, the Technology SIS generated potential categories (see Table 1) based on several published lists, including the ABLEDATA thesau-
The list also serves as a framework for topics described in core competencies and for technology training because it reflects technologies that can assist clients (seating and positioning, computer applications, and wheeled mobility), provides models for incorporating technology into daily practice (service provision, assessment, administration, and management), and identifies resources and networks for information dissemination.

Table 1

Areas of Technology Content on Which Competencies and Training Guidelines Are Based

<table>
<thead>
<tr>
<th>Topic</th>
<th>Technology Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessible architectural design</td>
<td>D</td>
</tr>
<tr>
<td>Administration and management</td>
<td>S</td>
</tr>
<tr>
<td>Augmentative and alternate communication</td>
<td>D</td>
</tr>
<tr>
<td>Computer applications (hardware and software)</td>
<td>S, D</td>
</tr>
<tr>
<td>Education</td>
<td>S</td>
</tr>
<tr>
<td>Environmental control</td>
<td>S</td>
</tr>
<tr>
<td>Funding</td>
<td>D</td>
</tr>
<tr>
<td>Information networking</td>
<td>D</td>
</tr>
<tr>
<td>Interface design</td>
<td>D</td>
</tr>
<tr>
<td>Job accommodation</td>
<td>D</td>
</tr>
<tr>
<td>Legislation</td>
<td>S</td>
</tr>
<tr>
<td>Light and daily living technologies</td>
<td>D</td>
</tr>
<tr>
<td>Neuromuscular electrical stimulation</td>
<td>D</td>
</tr>
<tr>
<td>Orthotics and prosthetics</td>
<td>D</td>
</tr>
<tr>
<td>Personal care aids</td>
<td>D</td>
</tr>
<tr>
<td>Personal transportation</td>
<td>D</td>
</tr>
<tr>
<td>Quantitative functional assessment</td>
<td>S</td>
</tr>
<tr>
<td>Recreation</td>
<td>D</td>
</tr>
<tr>
<td>Research</td>
<td>S</td>
</tr>
<tr>
<td>Technology transfer</td>
<td>S</td>
</tr>
<tr>
<td>Robotics</td>
<td>S</td>
</tr>
<tr>
<td>Seating and positioning</td>
<td>D</td>
</tr>
<tr>
<td>Sensory aids</td>
<td>D</td>
</tr>
<tr>
<td>Service delivery</td>
<td>D</td>
</tr>
<tr>
<td>Wheeled mobility</td>
<td>D</td>
</tr>
</tbody>
</table>

Note: S = Support of Therapy Technology, D = Direct Therapeutic Intervention Technology

Levels of competency in delivering clinical services have also been defined for occupational therapy assistants and occupational therapists. Key parameters re-
Regarding skill levels, amount and type of supervision required, and therapy versus evaluation duties across various topic areas are delineated (AOTA, 1992) and can be applied to the varying levels of technology-related knowledge and skills among occupational therapists.

Working from AOTA's role delineation (1992) and the COMPUTE project (1990), the Technology SIS proposed three levels of competency: Occupational Therapist: Foundation Level, Occupational Therapist: Technology Specialist Level 1, and Occupational Therapist: Technology Specialist Level 2.

**Occupational Therapist: Foundation Level**

The Foundation Level applies to minimum competencies all therapists should possess upon completion of preservice training. Therapists who have been practicing for a number of years should also consider themselves deficient in these competencies and should seek resources to acquire them through inservice continuing education. These competencies primarily reflect awareness and knowledge of the types of assistive technology, their uses, and their applicability to individual clients within occupational therapy frameworks. Therapists at this level are qualified to provide technology-related treatments with supervision and triage and referral services to clinicians at the Specialist Levels 1 and 2. A primary competency at this level is the ability to identify and use technology resource networks and information databases, such as ABLEDATA, to identify key technologies and services.

**Occupational Therapist: Technology Specialist Level 1**

Therapists who seek competency at Level 1 must complete technology training through a specialized program. Programs such as TechSpec at the University of Wisconsin–Madison (Pirtzflaff & Smith, 1991) include a core set of courses, electives, and an additional 50- to 60-hr clerkship with an occupational therapy technology specialist. Technology Specialists at Level 1 can provide unsupervised technology-related treatments and general troubleshooting assistance; however, they are not qualified to provide specialized technology assessments and evaluations, such as adaptive computer access or worksite accommodations. These specialists also may take on a role as technology team coordinator, managing and delineating the roles and services of interdisciplinary service provision teams within the clinic, community, school, work, and play settings.

**Occupational Therapist: Technology Specialist Level 2**

The Technology Specialist Level 2 has developed expertise in a specific application of technology, such as seating and positioning, computer access, powered mobility, driving, or augmentative communication. These specialists have completed continuing education and have at least 3 years of experience in a specific area of technology application or research or both. They are qualified to develop and conduct specific technology assessments and evaluations and to provide specific troubleshooting. They may work semi-independently or serve as specialized consultants. Therapists at the Specialist Levels 1 and 2 are encouraged to participate in the development and evaluation of new technologies and in the design and implementation of technology-related research projects.

**Results**

To date, Foundation Level competencies (see Appendix A) have been reviewed by a group of occupational therapists with technology expertise and representatives from occupational therapy training programs. These competencies are broadly worded to convey the primary objectives to be learned, while allowing for flexibility on the part of educators in selecting specific behavioral objectives and teaching methodologies based on existing resources within their programs.

A detailed list of suggested training methodologies and existing resources, many of which are provided free or at nominal cost, is available through the AOTA Technology SIS. Many of these competencies are already being taught within occupational therapy curricula. Many only need updating to reflect new technologies and technology-related services.

Of note is the addition to this list of specific competencies related to the use of information technologies, such as computers, fax machines, and modems. These competencies do not relate to adaptive computer access, but rather to basic, commercial personal computer and information technology operation. The ability to competently use information technologies, particularly personal computer-based hardware and software, is a critical survival skill (Naisbitt & Aburdene, 1990; Toffler, 1981). Technologies exist in virtually all settings and environments; therefore, it is incumbent on occupational therapists to be knowledgeable and capable of operating them, to be able to apply them to both clinical and administrative activities, to be able to perform simple troubleshooting strategies to keep them operational, and to be able to adapt them for client use.

Competencies for Occupational Therapist: Technology Specialist Level 1 have also been completed and are now undergoing review by the same set of experts (see Appendix B). This list reflects a more advanced level of competency, particularly in operating and troubleshooting technologies, and in providing interface specialist, team leader services.

Due to the level of specialization and advanced set of knowledge and skills required, separate Occupational Therapist: Technology Specialist Level 2 competencies will need to be developed within each content area.
shown in Table 1. Several specialty groups are being formed by occupational therapists with acknowledged expertise in specific areas of practice to draft these competencies and coordinate their efforts with other professional organizations, including RESNA (RESNA, in press), the American Speech-Language-Hearing Association (ASHA), and the American Physical Therapy Association.

Discussion

The broadly worded competencies contained in the Foundation Level and Occupational Therapist: Technology Specialist Level 1 are targeted to help education programs and practitioners think through their own curricula, knowledge, and skills. The next step in this process is to develop detailed behavioral objectives on which these competencies can be tested. For example, Boston University is currently pilot testing the competencies within its training curriculum. Specific behavioral objectives should be developed in conjunction with preservice training programs as they implement these guidelines, and should be based on the resources available within each program. This document, however, is considered an evolving one that demands refinement as the role of occupational therapists in the application of technology gains clarity. In the future, a similar set of competencies will be developed to address the training needs of practicing occupational therapists who are in need of introductory and advanced continuing technology education.

Specialized competencies are being developed within many professional organizations and agencies including RESNA (RESNA, in press; Warren, 1992), ASHA, Center for Special Education Technology (1991a, 1991b, 1991c), and State Education Departments (COMPUTE, 1990). Specific competencies for occupational therapy technology specialists will need to be reflected within these efforts. Therefore, competencies, training guidelines, and methodologies must be developed in coordination with these other rehabilitation technology professional groups. However, the Technology SIS strongly believes that occupational therapy technology competencies (Foundation Level, Technology Specialist Level 1, and Technology Specialist Level 2) must reflect and maintain the core philosophies and theoretical frameworks of the profession of occupational therapy and emphasize the strengths occupational therapists can bring to the assistive technology service provision process.

Methods for teaching technology also need to be developed and studied. Due to the lack of technology equipment and expertise, many programs must use available instructional resources, such as lectures, slides, and videotapes, to demonstrate the technologies. These materials must be supplemented with opportunities for direct, hands-on practice, first using the technologies, then applying them with consumers. This hands-on practice can be accomplished through field trips to technology centers and homes or offices of local consumers who have been using the technologies, as well as through equipment loans from rehabilitation technology suppliers. Modern technologies place curricula in pedagogical situations that ideally require substantial capital equipment. Optimal professional training practices in the area of technology have yet to be researched or identified.

Because the primary goal of occupational therapy is to take a global perspective of the client and optimize functional performance, the ability to select, adapt, and integrate various technologies within a client's life-style, daily activities, and required roles (homemaker, student, worker, and player) should be emphasized and incorporated into all aspects of occupational therapy curricula. Instead of learning about a specific technology product and its advertised use in isolation, occupational therapists should learn to identify the client's strengths, weaknesses, and needs and then match the optimal technology, class, category, or set of technologies to those needs. As most expert occupational therapy Technology Specialists know, technologies are frequently adapted to serve different purposes than were originally intended; in fact, the adaptation of tools has always been a primary task of occupational therapists. By focusing on technology from a functional perspective, the occupational therapist will learn how to identify key criteria for evaluating and integrating technologies and to set a hierarchical, needs-based approach to selecting technologies. Special attention should be paid to the application of technology across the life span. As consumers' needs change from initial acute care to rehabilitation to community living, so do their technology needs; it is important that occupational therapists be skilled in identifying current needs and in anticipating future needs. The ability to devise a solution that incorporates appropriate technology is critical. This conceptual blockbuster approach to designing and integrating technologies has been used within engineering curricula and should be applied in technology training for occupational therapists as well (Rosen & Goodenough-Trepagnier, 1990).

In addition to technology assessment, adaptation and integration, occupational therapists must be skilled in providing training in the installation, use, maintenance, and troubleshooting of technologies to clients with disabilities, significant others who interact with them on a daily basis, and other members of the technology team. Too often, rehabilitation professionals have fitted the current technology needs of the client and then fled. Ongoing monitoring of the client's needs across the life span coupled with effective technology training strategies are critical to assuring technology use and cost benefit; without these two elements, the technology will be relegated to the back of the closet.

The development of the competencies discussed in this paper are only the first step in providing technology training for occupational therapists. For these competen-
cies and training suggestions to be useful, occupational therapists will need to develop and access several key resources that are limited in availability. Successful education efforts appear to need comprehensive, up-to-date sets of technologies (assistive, rehabilitative, light, and high) and training materials; vendor support for technology training, client evaluation, and equipment loans and maintenance; occupational therapy Technology Specialists (Levels 1 and 2) and other rehabilitation professionals involved in technology service provision (engineers, machinists, educators, physical therapists, and speech and language pathologists) to serve as mentors; current, user-friendly technology information resources and databases; and support for continuing education, training, apprenticeships and fellowships, and research efforts.

Specific suggestions include the following:

- Continue to clarify and develop definitions of technology and content of the technology training for both preservice and inservice curricula.
- Research new ways for training when resources may not be available. Identify best educational practices. Investigate other agencies for training methodologies and evaluate how these could work with occupational therapists.
- Encourage participation of groups outside of AOTA to collaborate on providing training, scholarships, and key technology experts who can become mentors for occupational therapists and to investigate technology certification as coordinated through groups such as RESNA.
- Widely disseminate information about the availability of occupational therapy technology training programs and key resource facilities that offer a comprehensive set of technologies for therapists to use.
- Encourage occupational therapists to participate in research on technology, both in designing and evaluating new technologies, performing technology intervention functional outcome studies, and evaluating optimal methods for implementing training technology.
- Encourage other disciplines to include occupational therapists in collaborative research projects.
- Develop methods for realistic interdisciplinary training programs that can share resources and support team educational concepts and technology service provision.

In summary, technology is playing an increasingly pervasive role in our society. It is incumbent upon occupational therapy practitioners to develop competency in the use, application, and integration of technologies into our daily practice and into treatment interventions with persons with disabilities. Occupational therapists can lead in the development of future assistive technology certifications and service provision efforts; however, we as professionals must be proactive in developing and upgrading our technology knowledge and skills bases to do so. The adoption of technology competencies for occupational therapy practitioners and implementation of these competencies into preservice and continuing education programs is the first step in the process of establishing our identity and role within the assistive technology service provision arena.

Acknowledgments

We thank the many occupational therapists who helped draft and review the competencies, especially Judy Rein, MS, OTRL; Denis Anson, MS, OTR; Jennifer Angelo, PhD, OTR; and Theresa Gregano, MS, OTR. Special thanks is extended to Carol Gwin, OTR, who served as a reviewer and liaison with the American Occupational Therapy Association.

Appendix A

Technology Competencies for Occupational Therapists: Foundation Level

_Au/obted by the 1991–92 AOTA Technology Special Interest Section Standing Committee: Judy M. Hammel, MS, OTR; Roger O. Smith, MS, OTR; Judy Rein, MS, OTR; and Denis Anson, MS, OTR_

The Occupational Therapist at the Foundation Level will . . .

[P] 1. Link consumers with information resources (product databases, rehabilitation technology suppliers, funding/reimbursement, technology services, general advocacy/support organizations, conferences, continuing and in-service education).

[K] 2. Define terminology related to assistive and rehabilitative technologies (see Table 1 for categories).

[K] 3. Describe methods for applying and integrating a wide variety of technologies (assistive, rehabilitative, commercial) in order to improve functional performance of clients across the life span and functional levels.


[K] 5. Describe the application and incorporation of assistive technology within occupational therapy theories of practice (e.g., occupational science, human occupation, compensation versus assistive theory, rehabilitative, educational and medical models).


[K] 7. Describe the policies and impact of key legislation related to the delivery of assistive technology and consumer rights (e.g., Americans with Disabilities Act, Individuals with Disabilities Education Act, Rehabilitation Act, Technology Training Act).

[K] 8. Describe the application and incorporation of assistive technology within occupational therapy theories of practice (e.g., physical therapy, speech and language pathology, engineering, education, special education, educational technology, sociology, and anthropology).

[P] 9. Describe methods for realistic interdisciplinary training programs that can share resources and support team educational concepts and technology service provision.

[K] 10. Identify assistive technology services for clients whose needs exceed the services of the facility and staff.

[K] 11. Describe potential roles and qualifications of mem-

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Appendix B

Technology Competencies for Occupational Therapists: Technology Specialist Level 1

Authored by the 1992 AOTA Technology Special Interest Section Standing Committee: Jo' M. Hammel, MSHA, OTR, Roger O. Smith, MCH, OTR, Jennifer Angelo, PhD, OTR, and Theresa Gregario, MS, OTR

The Occupational Therapist Technology Specialist at Level 1 will:

[P] 1. Demonstrate proficient use of information resources that link consumers with technology resources (product and information databases, rehabilitation technology suppliers, funding and reimbursement, technology services, general advocacy and support organizations, conferences, continuing and in-service education), and ability to train assistive technology (AT) team members and consumers to access and use these resources.

[P] 2. Demonstrate proficiency in service provision methods, including making referrals, performing initial screening, and acquiring technology-related resource information, that actively involve consumers in the assistive technology evaluation and application process.

[P] 3. Explain terminology related to assistive and rehabilitative technologies in understandable terms to AT team members and consumers (see Table 1 for categories).

[P] 4. Demonstrate proficiency in the basic utilization, application, and integration of a wide variety of technologies (assistive, rehabilitative, commercial) which improve the functional performance of clients across the life span and across functional levels of performance.

[K] 5. Demonstrate basic assistive and rehabilitative technology troubleshooting strategies.

[K] 6. Provide theoretical justification for the application and incorporation of assistive technology within occupational therapy practice (e.g., occupational science, human occupation, compensation versus assistive theories, rehabilitative, educational, and medical models).

[P] 7. Produce detailed, customized justifications for reimbursement of assistive technology with protocols from a variety of commonly used reimbursement sources.

[K] 8. Explain and summarize the policies and implications of key legislation, as related to ensuring the civil rights of consumers with disabilities and delivering assistive technology, to AT team members, consumers, and public policy makers (e.g., Americans with Disabilities Act, Individuals with Disabilities Education Act, Rehabilitation Act, and Technology Training Act).

[P] 9. Apply and integrate relevant theoretical models from other fields within AT intervention summary reports and presentations (e.g., physical therapy, speech and language pathology, engineering, medicine, education, special education, educational technology, sociology, anthropology, administration, and business).

[K] 10. Identify when other AT specialists are required due to the lack of availability of personnel and facility services, make appropriate referrals for these services, and integrate specialized evaluation information obtained from these sources into ongoing AT intervention plans.

[P] 11. Use and coordinate services of other relevant AT team members in AT service delivery, and explain the role of these team members to consumers.

[P] 12. Demonstrate proficiency in teaching basic information technology concepts and skills to AT team members and consumers (e.g.: basic operation of personal computer hardware), commonly used peripherals (printers, monitors, input and output devices), software operating systems and applications (e.g.: word processing, graphic, spreadsheet, database, functional measurement), and related technologies (e.g., telecommunication, fax, and multimedia).


[P] 14. Explain computer and computer-based technologies terminology and concepts to AT team members and consumers, including the implication of these concepts to relevant functional needs.

[K] 15. Describe advantages and disadvantages of specific personal computer systems (hardware, software, and peripherals), and assist Technology Specialists Level 2 in selecting optimal integrated computer system(s) for individual consumers.


[P] 19. Present and discuss benefits and limitations of assistive technology interventions with AT team members and consumers, and prioritize interventions according to criteria such as functional performance, availability, and cost-benefit.

Note. K = knowledge level, P = process level
20. Identify and address ethical dilemmas and issues posed by technology interventions with persons with disabilities.

21. Integrate results of psychosocial and social assessments into written intervention plans to utilize technologies in a variety of environments (e.g., home, school, play and leisure, and community).

22. Coordinate efficacy and outcome studies to justify the use and adaptation of assistive technologies and technology interventions for persons with disabilities.

23. Perform, summarize, and present results of assistive technology program evaluations.

24. Acknowledge the personal strengths and limitations of your technology-related knowledge and practice base to consumers and team members and identify and attend continuing education activities to address these limitations.

Note: P = process level, K = knowledge level

References


Individuals with Disabilities Education Act of 1990 (Public Law 101–476).


RESNA Quality Assurance Committee (in press). RESNA guidelines for basic curriculum development and credentialing for assistive technology providers. Washington, DC: RESNA.


