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# Upd(AT)e: an online professional development program for assistive technology for computer access

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BOSTON UNIVERSITY  
SARGENT COLLEGE OF HEALTH AND REHABILITATION SCIENCES

Doctoral Project

**UPD(AT)E:  
AN ONLINE PROFESSIONAL DEVELOPMENT PROGRAM  
FOR ASSISTIVE TECHNOLOGY FOR COMPUTER ACCESS**

by

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requirements for the degree of  
Doctor of Occupational Therapy

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## **DEDICATION**

I would like to dedicate this work to my husband Danny, my son Leo, my mom, and my future family.

## **ACKNOWLEDGMENTS**

First and foremost, I'd like to acknowledge my husband, Daniel. Thank you for always supporting me from day one, even when earning my doctorate was just an idea at date night. Thank you for taking over reading bedtime stories when I had to attend class or catch up on schoolwork. Even though I didn't show it as much as I should have, I'm grateful for all the proofreading and feedback you gave me on my papers and presentations. All of this would not have been the same without your support.

To all of my family and friends, but especially to my mom, thank you for always believing in me and pushing me to be the best version of myself. Thank you for all the extra playdates you had with Leo.

To my son Leo, I love you. I'm proud to be your mama. When you get older, I want you to know that you were with me throughout this whole journey.

Thank you to my academic mentor, Megan Silvia, for helping to develop my literary writing skills and for introducing me to track changes. Your patience over the last two and a half years has truly helped me to become a better writer. And last but not least, thank you to my peer mentor, Nora Kinslow, for being a rockstar partner. I'm so lucky to have had your positive spirit guide me throughout this program.

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**ABSTRACT**

According to the Assistive Technology Act of 2004, assistive technology is defined as, “any item, piece of equipment, or product system, whether acquired commercially, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities.” The use of AT helps persons with neurological diagnoses independently access their personal devices (Folan et al., 2015). Though occupational therapy practitioners (OTPs) have a unique understanding of how to use AT for computer access, many do not feel confident to use it in practice (Arthanat et al., 2017; Dishman et al., 2021). Additionally, research has shown that although AT is a part of an OTPs entry-level curriculum, most clinicians report they would have liked more training on proper use, resources and funding available, (Dishman et al., 2021; Long et al., 2007). The lack of confidence due to limited training, resources and funding leads to decreased recommendation of AT for computer access. If OTPs are not recommending AT for computer access for individuals with neurological diagnoses, then they may be at risk for occupational injustices.

*Upd(AT)e* aims to improve OTPs confidence in recommending and utilizing AT for computer access with persons with neurological diagnoses. This proposed program is rooted in evidence and has been developed using constructs from the Social Cognitive Theory (SCT) and the Human, Activity, Assistive Technology (HAAT) model. This eight-hour, synchronous course will provide participants with the opportunity to learn about hardware and software available to best serve individuals with neurological diagnoses. Participants will also have mentorship experiences with AT experts as they will collaborate to problem solve case studies and apply gained knowledge. By the end of this program, OTPs will report an immediate improvement of confidence and knowledge of AT for computer access. *Upd(AT)e* will assist participants in translating their learned skills into clinical practice when working with individuals with neurological diagnoses.



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## LIST OF ABBREVIATIONS

ACOTE .....	Accreditation Council for Occupational Therapy Education
ADLs.....	Activities of Daily Living
AJOT.....	American Journal of Occupational Therapy
ALS .....	Amyotrophic Lateral Sclerosis
AOTA .....	American Occupational Therapy Association
AOTF .....	American Occupational Therapy Federation
AT .....	Assistive Technology
ATOB.....	Assistive Technology Outcomes & Benefits
ATP .....	Assistive Technology Professional
CDC .....	Centers for Disease Control
CVA .....	Cerebrovascular Accident
DME.....	Durable Medical Equipment
HAAT .....	Human, Activity, Assistive Technology
IADLs .....	Instrumental Activities of Daily Living
MS.....	Master of Science
OT .....	Occupational Therapy
OTA .....	Occupational Therapy Assistant
OTD .....	Occupational Therapy Doctorate
OTP .....	Occupational Therapy Practitioner
OTPF-4 .....	Occupational Therapy Practice Framework, 4 <sup>th</sup> edition
PD .....	Professional Development

QoL .....	Quality of Life
RESNA .....	Rehabilitation Engineering Society of North America
SCI .....	Spinal Cord Injury
SCT .....	Social Cognitive Theory
TBI .....	Traumatic Brain Injury
WFOT .....	World Federation of Occupational Therapists

## **CHAPTER ONE – Introduction**

### **The Problem**

There is a gap in knowledge of the benefits of the use of assistive technology (AT) for computer access within the neurological population in the occupational therapy (OT) community. The root of this problem is a result of clinicians not feeling comfortable or confident incorporating AT into their interventions (Dishman et al., 2021). There are multiple factors contributing to this problem including limited exposure to AT within entry-level curriculums, lack of available post-educational opportunities for AT, and a decreased awareness of availability of AT resources (such as funding and equipment) within work settings. Given these factors, a synchronous, online professional development course, with mentorship opportunities has been developed to address these areas of need and increase opportunities for occupational therapy practitioners (OTPs) to further their knowledge and confidence with AT for computer access.

### **Consequences of the Problem**

Understanding the role and increasing the utilization of AT within OT is an important knowledge gap to address as it can directly impact common populations served by OTPs. Assistive technology may be beneficial to populations with neurological conditions, but can often be overlooked, as many clinicians are unaware or uncomfortable with its use (Dishman et al., 2021). Specific neurological populations that would benefit from AT may include, but are not limited to: traumatic brain injury (TBI), stroke/cerebrovascular accident (CVA), spinal cord injury (SCI), amyotrophic lateral sclerosis (ALS), Parkinson's Disease, and multiple sclerosis. These conditions can have a

significant impact upon an individual's participation in valued activities and quality of life.

According to Barthels and Das (2020), CVA affects more than 795,000 people per year and is also the leading cause of long-term disability in the United States.

Additionally, the Center for Disease Control (CDC) reported 288,000 TBI related hospitalizations in the United States in 2014 alone (Capizzi et al., 2020). Disabilities from such neurological events have led persons to have a decreased quality of life (QoL) due to difficulty with independently completing activities of daily living (ADLs) and engaging in meaningful activities, such as socialization (Jun et al., 2015). Socialization is a key aspect of a person's well-being and has a large impact on an individual's QoL (American Occupational Therapy Association (AOTA), 2020). According to Baldassin et al. (2018), AT for computer access may be crucial in how a person with a SCI can access information, social networks, work-related tasks and leisure activities, which affects how an individual is able to socialize with others. These authors also indicate that it is one of the vital roles of rehabilitation professionals to introduce AT to patients in order to assist them in engaging in social interactions autonomously.

In the systematic review evaluating various types of AT to assist with computer access, Baldassin and colleagues (2018) determined the extent to which computers play a vital role in engaging in socialization and leisure, completing work related tasks, or participating in education. Additionally, Pousada et al. (2021) similarly studied the importance of computer access and concluded that it allows persons with disabilities to participate in daily activities and normalize life conditions. This improvement of

computer access with the use of AT allows for a person with a neurological diagnosis to participate in meaningful activities more independently.

According to the World Federation of Occupational Therapists (WFOT), OTPs carry a unique perspective about AT as they take into consideration the individual's abilities, desired activity, and context to better understand barriers and modifications needed (WFOT, 2012). The use of AT is within the domain of OT because it can be utilized to assist patients in maximizing their current skill set and to independently participate in occupations of activities of daily living (ADLs), instrumental activities of daily living (IADLs), work, education, health management, leisure, and social participation (AOTA, 2020) as independently as possible within their least restrictive environments. Given that technology plays a vital role in work, education, socialization, and leisure, it is no surprise that AT should be integrated more comprehensively into the OT educational curriculum (Dishman et al., 2021). However, it is important to note that technology is constantly evolving and clinicians may have difficulty staying up to date (Howard et al., 2022).

Although AT offers many benefits to individuals with neurological conditions, unfortunately, OTPs do not feel that their entry-level curriculum (of all levels of education) properly prepared them for the utilization and recommendation of AT use in the clinic (Dishman et al., 2021). This lack of education and expertise in AT in turn affects the clinician's ability to educate others such as patients, caregivers, family members and even peers (Riemer-Reiss, 2003). A study completed by Brady et al. (2007) concluded this lack of knowledge of OTPs in the area of AT, leads to lack of comfort



with educating and prescribing AT to patients, thus leading to the underutilization of AT to complete ADLs. More specifically, computer access is an area that OTPs do not feel comfortable utilizing in their interventions due to lack of confidence with commercially available AT resources (Dishman et al., 2021). Furthermore, OTPs expressed difficulties using the existing AT in their own workplace due to personal discomfort, limited knowledge, complex technology, cost of support, and time required to be proficient (De Jonge & Rodger, 2006). In turn, this affects the clinician's ability to assist the patient in meeting his/her/their therapeutic needs (Connor et al., 2018).

### **Cause and Contributing Factors to the Problem**

There are several issues that contribute to the gap in knowledge of and underutilization of AT for computer access. These include but are not limited to a variance in entry-level OT curriculum, lack of professional development (PD) opportunities, and decreased awareness of available resources within an OTPs' clinical setting, including funding and equipment available.

The Accreditation Council for Occupational Therapy Education (ACOTE) standard B.4.11 requires accredited Master of Science (MS) and Occupational Therapy Doctorate (OTD) programs to teach students to, "assess the need for and demonstrate the ability to design, fabricate, apply, fit, and train in assistive technologies and devices (e.g., electronic aids to daily living, seating and positioning systems) used to enhance occupational performance and foster participation and well-being" (ACOTE, 2018, p. 30). Furthermore, this standard varies across OT and occupational therapy assistant (OTA) degrees. Although academic institutions are mandated to abide by the ACOTE

standards, they do have flexibility in terms of how curriculums are designed. This affords universities and colleges to develop unique and varied curriculums. However, research indicates program directors may have difficulty adequately fulfilling this AT standard.

Despite the inclusion of AT as a mandatory part of the OT curriculum, research indicates many educators are unfamiliar or uncomfortable with teaching about AT in the classroom (Dishman et al., 2021). According to an exploratory study conducted by Dishman et al. (2021), faculties' expertise with AT is generally limited, thus affecting the ability to teach AT to OT students. This study also found that nearly 50% of OTPs surveyed felt they did not receive adequate education on computer access during their OT education program. With the findings of this research, this author created *upd(AT)e*, an online PD program for OTPs who are interested in learning more about AT for computer access for persons with neurological diagnoses.

According to Arthanat et al. (2017), the clinicians surveyed felt that their gap in training and education of AT was influenced by the lack of faculty expertise in educational programs. Additionally, the lack of available PD opportunities courses and time limitation also contributes to this knowledge gap. Unfortunately, graduate programs, and post-educational training opportunities for professionals who provide AT services are limited (Arthanat et al., 2017). According to Gitlow & Sanford (2003), there is a lack of educational programs to train professionals, which therefore limits access to users who may benefit from AT. In addition to the lack of availability of training programs, Hughes (2020) identified time as a barrier to completing continuing education courses on an online platform. Time required to travel, time away from work, financial responsibilities

and availability of courses serve as barriers for OTPs to attending PD opportunities (Johnson Coffelt & Gabriel, 2017).

In addition to the aforementioned factors contributing to an OTP's lack of comfort in utilizing and recommending AT for computer access, AT is not typically covered by insurance, which could lead to a financial burden in obtaining and prescribing devices (Kuo & Kosciulek, 2021). Durable medical equipment (DME) can be covered by Medicare, Medicaid and private insurances with justification from providers (Wallace, 2011). A professional with experience in prescribing and acquiring AT can successfully find resources for funding (Wallace, 2011), however, this may be difficult if the clinician is unaware of what is available.

### **Proposal to Address the Problem**

A survey conducted by Dicianno et al. (2019) highlighted the need to create a continuing education course for consumers and practitioners on what AT resources are available, how each is used, new technologies and how to recommend the most appropriate device. This author aims to address this gap in knowledge by creating the *upd(AT)e* program. This is an evidence-based program designed with consideration of empirical research identified through extensive literature reviews as well as an exploratory needs assessment survey completed by this author. *Upd(AT)e* is an eight-hour, synchronous online course offered to OTPs that focuses on improving clinician's comfort and confidence with utilization and recommendation of AT for computer access.

According to the American Occupational Therapy Association (AOTA) (2017), PD assists in improving the practitioner's engagement in professional activities that lead

to advancements in practice. Therefore, *upd(AT)e* aims to educate OTPs on the benefits of use of AT for computer access for patients with neurological diagnoses and how it can positively impact an individual's ability to participate in their ADLs/IADLs, education/work related tasks and social interactions. Participation in *upd(AT)e* can assist in improving OTP's confidence and familiarity with AT, leading to increased comfort with prescription and recommendations of AT. This increase in comfort will allow the practitioner to better educate patients and their caregivers on proper use to improve independence in their preferred activities and minimize abandonment of the prescribed device.

The findings of the needs assessment survey have provided supporting evidence on the need to incorporate AT more effectively into clinician's intervention planning. The data analyzed from the survey was used to identify what information is most relevant to present during the course. Furthermore, the content and success of this program will be evaluated by providing participants with a pre- and post-survey to identify changes in clinical knowledge and comfort with utilization and recommendation of AT for computer access. Participants will also have the opportunity to provide open ended feedback to the program facilitators in order to improve learning experiences of future participants.

## **CHAPTER TWO – Project Theoretical and Evidence Base**

### **Overview of the Problem**

To support the creation of this program, this author sought to find literature to identify why assistive technology (AT) is infrequently used by occupational therapy practitioners (OTPs) in clinical practice. It can be assumed that all OTPs are experiencing barriers that may lead to the decrease in recommendation of AT, which in turn affects the likelihood of OTPs recommending AT for persons who would benefit from use.

According to Dishman et al. (2021), many OTPs report their entry-level education did not appropriately prepare them for including AT as an intervention in their daily practice.

Within this study, 67% of OTPs surveyed wished to receive more education on computer access (Dishman et al., 2021). Unfortunately, though many OTPs feel they would benefit from more education on AT for computer access, not many post-educational opportunities, such as continuing education courses or onsite trainings, are convenient and readily available (Long et al., 2007). Even when these are opportunities are available, funding and the availability of AT for education and trial is limited (Arthanat et al., 2017).

### **Theoretical Frameworks**

For the purposes of this doctorate project, constructs of Social Cognitive Theory (SCT) are used to explain the effect of the entry-level curriculum, lack of post-educational opportunities, funding and availability of AT for computer access and how it impacts the practitioner's frequency of recommendation to persons with neurological diagnoses. Social Cognitive Theory explores the social environment and its effect on the

learner's motivation, learning and self-regulation (Schunk & Benedetto, 2020). The six constructs of the SCT include reciprocal determinism, behavioral capability, observational learning, reinforcements, expectations, and self-efficacy (LaMorte, 2022). For the purposes of this program, self-efficacy, observational learning and reciprocal determinism will be used to further explore the barriers that OTPs experience in relation to the utilization and recommendation of AT for computer access.

Self-efficacy is the perceived ability to learn and carry out actions at specific levels (Schunk & DiBenedetto, 2020). Motivation is a vital component of the learner's self-efficacy and is defined as, "a willingness of the learner to embrace learning" (Braungart, 2020, p. 246). According to Schunk and DiBenedetto (2020), motivation plays an integral role in attaining a practitioner's professional goals and is a key component to how a learner values AT. The learner's motivation is also related to how much of an effort the practitioner makes towards expanding their learning of AT (Dishman et al., 2021). Among the open-ended responses in the survey this author provided to OTPs, one respondent reported, "I am complete self-studied on the topic but feel like my dedication to it has made a difference." It can be assumed that if an OTP is motivated to use AT in their daily practice but are not comfortable or not confident, then they will seek out additional learning opportunities to refine their skills. The concept of reciprocal determinism explores the interaction of the OTP, the environment, and the drive to learn more about AT for computer access. If an OTP does not have exposure to AT in their entry-level curriculum and has limited access to AT resources within their workplace, their motivation to pursue additional learning opportunities for AT for

computer access may be impacted.

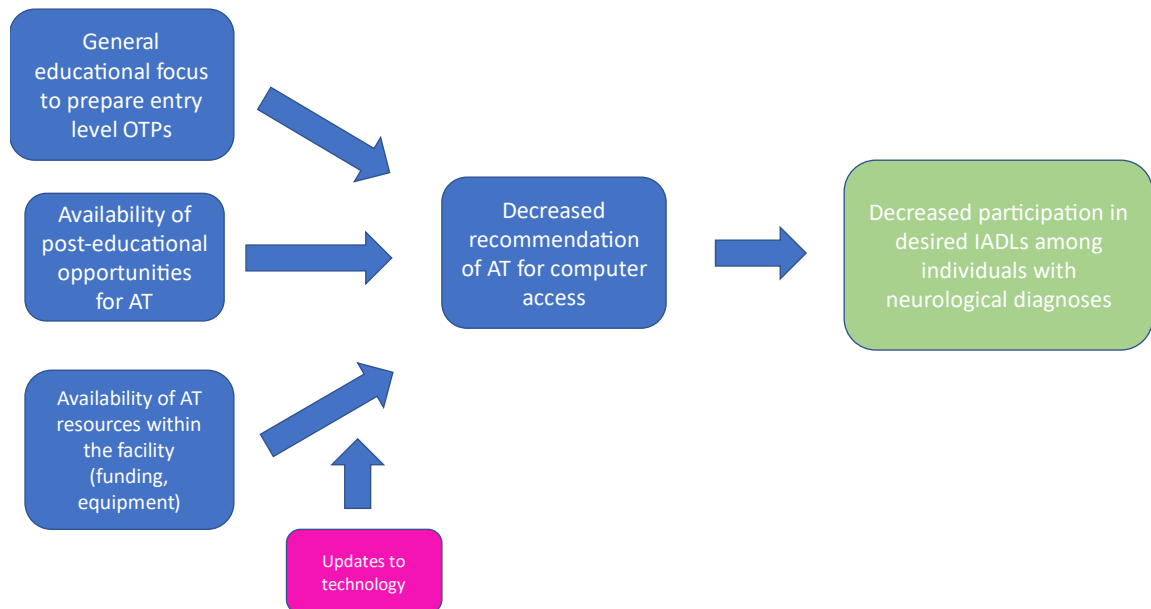
In accordance with SCT, if a learner has opportunities for observational learning and are given reinforcements throughout the learning experience, this will improve their behavioral capabilities and thus improve their confidence and comfort level with recommending AT for computer access. Therefore, if the OTPs' perceived ability to utilize and recommend AT for computer access in their interventions improves, their self-efficacy will also improve. Clinicians have reported that their entry-level curriculum was inadequate regarding training them for AT use and prescription (Dicianno et al., 2019; Dishman et al., 2021; Long et al., 2007). If one's entry-level curriculum focus on AT is perceived as insufficient, then it is understandable that clinician's comfort may also be low. The concepts of SCT explain this gap in knowledge as OTPs did not have enough opportunities to observe and learn from experts in AT embedded within their entry-level curriculum, thus leading to low self-efficacy and motivation to use this clinical intervention in practice. This lack of confidence leads to decreased use of AT in therapeutic interventions for persons who may benefit, specifically persons with neurological diagnoses. Self-efficacy can have a strong influence on behavior, how much effort is placed on an activity, thought patterns and emotional reactions (Scherrer & Preckel, 2019), thus affecting the frequency of utilization and recommendation of AT for computer access. However, even if learners are afforded observational learning opportunities and are motivated to learn, the availability of resources and continuing education opportunities are limited (Long et al., 2007).

According to Brady et al. (2007), the American Occupational Therapy Association (AOTA) curriculum mandates that students should be able to assess and use orthotics, prosthetics, and assistive devices and technology in interventions with patients. Studies have found that the faculty expertise in AT is limited, thus affecting how AT is integrated into a program's curriculum (Brady et al., 2007). However, the reality is that even with this mandate, this author found that over 77% of OTPs who participated in the survey do not feel that their entry-level education prepared them to use AT in their interventions.

### **Explanatory Model of the Problem**

Figure 2.1 demonstrates the explanatory model of the problem identified. These elements assisted the author to identify research questions to guide the literature review.



**Figure 2.1***Explanatory Model of the Problem*

AT = assistive technology, OTPs = occupational therapy practitioners, IADLs = instrumental activities of daily living

The first element indicated in the explanatory model is the general educational focus to prepare entry-level practitioners. As previously mentioned, AT is a mandated topic by Accreditation Council for Occupational Therapy Education (ACOTE) standards to be addressed in entry-level curriculum. However, curriculum may vary among institutions. While the OTP's curriculum is catered to preparing the individual to enter the field as a generalist, with basic exposure to current model systems (ACOTE, 2020), this exposure may not equip them with the proper knowledge and skill set to recommend AT. Without this opportunity for observational learning at a vital time of the OTPs' education, it is understandable as to why most respondents of the independent survey felt

that their entry-level curriculum did not prepare them for the use of AT, thus leading to a decreased recommendation of AT for computer access.

The second element of this model is the availability of professional development (PD) opportunities for AT. Occupational therapy practitioners who are eager and motivated to learn more about AT for computer access experience barriers to PD opportunities as there are not many available. As concluded by the survey done by this author, 27 out of the 49 respondents felt that continuing education opportunities were not easily accessible. According to the SCT, learners should be afforded opportunities for observational learning (LaMorte, 2022) to improve their knowledge and skill of use. This can be by means of attending a continuing education course or learning side by side with a mentor.

The third element is the availability of AT resources within the facility, specifically for funding and having the equipment and AT resources readily available for use and practice. According to a survey conducted by this author, 39 out of 49 respondents felt that they were unaware of funding options, equipment costs, and opportunities for insurance coverage. This element is similarly related to the concept of reciprocal determinism of the SCT, specifically referring to the external social context (LaMorte, 2022). As demonstrated by the model, if OTPs are receiving a general educational focus in their entry-level curriculum, they have limited AT post-educational opportunities, as well as lack of availability of resources such as funding and equipment. This leads to decreased recommendation of AT for computer access for individuals who may benefit from it. If OTPs are not recommending AT for computer access, then these

individuals will be less likely to independently participate in meaningful and desired instrumental activities of daily living (IADLs).

### **Evidence Research Conducted on the Problem**

In creating the proposed online professional development program, this author aimed to complete a needs assessment as well as a comprehensive review of the current literature available. The author conducted an extensive search of the literature to answer the following questions:

- Does a general education focus for entry-level occupational therapy practitioners (OTPs) affect comfort with utilizing and recommending assistive technology (AT) for computer access?
- Does the availability of post-degree AT training and education opportunities affect the confidence utilization and recommendation of AT for computer access among OTPs?
- Does the availability of AT resources in the workplace affect the comfort utilization and recommendation of AT for computer access by OTPs?

The author of this program searched the databases PubMed, CINAHL and PsycINFO to identify current literature to support the need for additional learning opportunities for assistive technology. The following search terms were used: “assistive technology” AND “Arthanat (author),” “assistive technology” AND “curriculum,” “assistive technology curriculum,” “assistive technology” AND “education,” “assistive technology” AND “education needs,” “assistive technology” AND “occupational therapy” AND “curriculum,” “assistive technology” AND “entry-level education” AND

“occupational therapy,” “assistive technology” AND “occupational therapy,” “assistive technology” AND “education,” “assistive technology” AND “curriculum,” “assistive technology” AND “computer access,” “assistive technology” AND “perception,” “assistive technology” AND “barriers,” “assistive technology” AND “provision.” Limits were set to include the years between 1998 and 2024, published in English and in academic journals.

### ***Entry Level Curriculum of AT***

The research identified by this literature review suggests that an entry-level curriculum, focused on providing students with a general education, may decrease the prevalence of future practitioners recommending AT for computer access. A cross-sectional study by Gitlow and Sanford (2003) found that 67% of OTPs surveyed reported a gap in their knowledge of AT for computer access, thus affecting their comfort in recommending AT and utilizing this valuable intervention for persons with neurological diagnoses. Similarly, Kanny and Anson (1998) identified that only 38% of OTPs surveyed felt the quality of their education of AT was adequate or higher. In a separate, more recent study, 64.8% of AT service providers surveyed felt that their entry-level training was inadequate (Arthanat et al., 2017). Similar to this study, Dishman et al. (2021), determined over 60% of the OTPs who participated in the study reported the need to incorporate more training of AT for computer access in their entry-level curriculum. Dicianno and colleagues (2019) found that AT practitioners needed more training in AT for computer access. Other studies also found the lack of knowledge and training of healthcare professionals serve as a barrier to service provision of AT (Howard et al.,

2022). Manship et al. (2024) conducted a systematic review that explored articles that suggested the basic education healthcare professionals received did not adequately prepare them to utilize AT in their interventions. Among the studies found, researchers mostly used surveys to gauge practitioner's perceptions of their entry-level training (Kanny & Anson, 1998; Long et al., 2007; Arthanat et al., 2017; Dishman et al., 2021). The studies completed by Long et al. (2007), Kanny and Anson (1998), and Dishman et al. (2021) surveyed only OTPs, while the other studies surveyed Assistive Technology Providers (ATPs) from other disciplines such as physical therapy, speech language pathology, and included other clinicians from the interdisciplinary team such as counselors, educators, orthotists, manufacturers and researchers (Arthanat et al., 2017; Dicianno et al., 2019; Gitlow & Sanford, 2003; Manship et al., 2024).

Though the study by Dishman et al. (2021) focused on OTPs' perception of their training, this literature review found the other research available specifically for OTPs is dated (Long et al., 2007; Kanny & Anson, 1998). There is limited research available from 1998 to 2024 that focus solely on how this directly correlates with the OTPs' frequency of utilizing and recommending AT. The systematic review by Manship et al., (2024) includes articles that studied the perceptions of training of all healthcare professionals who recommend AT, including OTPs. Howard et al. (2022) was the only meta-synthesis review within the research identified that conducted a literature review rather than a survey to provide evidence supporting the need for improved entry-level training.

### ***Availability of AT Professional Development Opportunities***

The research from this literature review suggests the lack of courses that exist for post-degree education for AT is correlated to how frequently AT is utilized and recommended. In the survey of AT providers conducted by Dicianno et al. (2019), the authors concluded the development of training programs to educate clinicians would assist and improve practice. According to the study by Long et al. (2007), OTPs reported that of the limited number of courses offered, the timing and locations were not convenient or easily accessible. The study by Gitlow and Sanford (2003) provided a survey to 59 ATPs and 67% of participants reported a gap in knowledge of AT and AT resources, affecting their ability to properly recommend AT. Howard et al. (2022) also reported that due to this lack of training opportunities, AT users felt that their providers were not up to date with the current technology.

In addition to the need for more AT education opportunities within graduate program curriculums, AT practitioners in the field also describe a lack of post-education training opportunities available as an additional barrier to their comfort (Long et al., 2007; Manship et al., 2024). Even if these trainings were more convenient to attend, healthcare professionals reported limited time to attend available training opportunities as they prioritize other aspects of patient care (Manship et al., 2024; van Niekert et al., 2018). In the survey conducted by this author, one of the respondents stated, “technology changes so fast it can be difficult to keep up.” Another respondent acknowledged the change in technology and reported, “my entry-level degree did not have anything about computer access because computers were not easily available at that time.” Of all the

articles identified by Manship et al. (2024), one third discussed the importance of ongoing training and continuing education opportunities and its positive effect on clinical practice and AT user satisfaction. Therefore, the research found by this literature review highlights the importance of training in relation to AT user satisfaction.

Most of the articles utilized a survey-based approach by administering questionnaires to ATPs in order to identify gaps in knowledge and expertise of AT for computer access (Dishman et al., 2021; Dicianno et al., 2019; Gitlow & Sanford, 2003; and Long et al., 2007). Though OTPs are included as participants in all of the studies, it is important to note that only two of the four studies included only OTPs (Long et al., 2007; Dishman et al., 2021). In addition to OTPs, the remaining five studies included a combination of ATPs such as physical therapists, speech language pathologists, nurses, physicians, counselors, social workers, orthotists and prosthetists (Dicianno et al., 2019, Gitlow & Sanford, 2003, Manship et al., 2024; van Niekerk et al., 2018).

### ***Availability of AT Resources***

The articles found from this literature review explored the relationship between the lack of resources and its effect on frequency of clinician recommendation for AT for computer access. Research indicated the lack of funding and government policies and regulations (Arthanat et al., 2017; Dicianno et al., 2019; Howard et al., 2022; van Niekerk et al. 2018), limited availability of AT for trial (Dicianno et al., 2019), and inconsistencies among different suburban, urban and rural locations (Gitlow et al., 2003) each negatively affect overall service provision of AT. Lack of funding to support AT utilization in the workplace is not a new barrier and has been mentioned in the literature

for more than 20 years. In 2003, Gitlow and Sanford reported a significant need for more information on funding for AT. Furthermore, clinicians who recommend AT report that funding constraints impact their interventions and their ability to effectively track funding policies (Arthanat et al., 2017). The authors of this study found 77.2% of AT service providers report that funding policies negatively affect daily intervention (Arthanat et al., 2017).

## **Conclusion**

This review of the literature identified several problems. Firstly, OTPs do not feel their entry-level training prepared them to effectively utilize AT for computer access in their interventions (Arthanat et al., 2017; Dishman et al., 2021; Dicianno et al., 2019; Gitlow & Sanford, 2003; Long et al., 2007; Manship et al., 2024). However, the research available that is specific to OTPs is limited. Therefore, though evidence is emerging, more research would be beneficial to gauge OTP's perception of their entry-level training and how it prepared them to enter the field of AT.

Secondly, the evidence provided by this literature review concluded that the gap in knowledge of AT is challenging to fill due to lack of resources and educational opportunities. Though the evidence located supports this conclusion, the research regarding AT resources in the last 10–15 years is limited. According to the articles found, the lack of training of healthcare professionals of AT is a barrier to service provision (Long e al., 2007; Howard et al., 2022). Additionally, these articles found that healthcare professionals were also not up to date on available products The improvement of



accessibility to AT resources, such as PD courses, could assist to bridge the gap of knowledge between entry-level training and practice in the field. Though there is evidence to support the need for post-educational opportunities for AT, more research describing the effect of lack of resources on the frequency of utilization and recommendation of AT would be beneficial as well. To overcome these barriers, this author created *upd(AT)e*, an online, synchronous, professional development program and provide accessible learning opportunities for OTPs interested in learning more about AT for computer access.

## **CHAPTER THREE – Overview of Current Approaches and Methods**

### **Introduction**

The purpose of this chapter is to review the effectiveness of utilizing online learning as an educational format for occupational therapy practitioners (OTPs) to increase their knowledge and clinical utilization of assistive technology (AT). As identified in Chapter Two, research indicates that OTPs do not feel their entry-level education has prepared them to utilize assistive technology in their daily interventions (Dishman et al., 2021; Long et al., 2007). According to Accreditation Council for Occupational Therapy Education (ACOTE) accreditation standards, an occupational therapy (OT) student must be able to assess the need and fit for AT (ACOTE, 2018). However, this standard may be interpreted differently by entry-level program directors when designing curriculums. In addition to this difference in interpretation, program directors have difficulty filling this requirement which in turn, may affect the future OTP's perceived level of competence once they enter the clinical setting (Dishman et al., 2021). Aside from limited exposure to AT during graduate programs, research also indicates that there are limited post-educational opportunities and resources available to OTPs (Dicianno et al., 2019). Given these limitations, it can be inferred that OTPs are less likely to utilize and recommend AT in their day-to-day practice. If OTPs infrequently utilize or recommend AT in their daily interventions, then persons who may benefit from these supports may be at increased risk for occupational injustice. One population who benefits from the use of AT, more specifically, AT for computer access, to participate in desired instrumental activities of daily living more independently includes those with

neurological diagnoses (Folan et al., 2015; Lim et al., 2020).

To address this problem and increase accessibility of AT for computer access among individuals with neurological conditions, the author of this study has created *upd(AT)e*, an online PD program to improve OTPs's knowledge and confidence in utilizing and recommending AT for computer access.

A literature review was conducted to identify research articles that support the effectiveness of online learning. This literature review aimed to answer the following questions:

1. What are the positive outcomes of online learning?
2. What active learning strategies for online learning are most effective?
3. What is the effectiveness of online learning for OTPs on the use of AT?

Four databases were used to search for supporting articles: PsycINFO, CINAHL, PubMed and ERIC. The search terms “online professional development or online professional learning” AND “therapy,” “online learning” OR “e-learning” OR “distance learning” AND “occupational therapy” AND “assistive technology,” “digital learning or mobile learning or e-learning or online learning or distance learning AND professional development” were used to narrow the results to the most relevant articles. Limitations were set to only include research articles published in the English language in academic journals between the years of 2013 and 2023.

## **Evaluative Summary**

### ***Determining Effectiveness of Online Learning***

Online learning provides opportunities for clinicians all over the country to overcome geographical barriers and participate in continuing education opportunities (Ramsden et al., 2022). A scoping review conducted by Ramsden et al. (2022) evaluated existing literature to determine the effectiveness of providing PD, education, and training to healthcare providers through online learning platforms. This review identified articles that utilized multimodal approaches to online learning, such as case studies, self-paced learning modules, and direct engagement between educator and learner. The authors of this study concluded that over 77% of the articles found an improvement in knowledge of the content presented. Ramsden and colleagues (2022) also found that 81% of healthcare practitioners who lived in rural areas reported improved access to education and the acquisition of new knowledge. Similarly, a systematic review conducted by Bragg et al. (2021) sought to determine the outcomes of online PD for elementary and secondary school teachers. The authors of this study found positive outcomes in teacher's content knowledge and instructional practices in over 66% of the articles found. Of the articles identified by this review, over 80% concluded that online learning leads to improvement in content knowledge and learner satisfaction (Bragg et al., 2022). Separately, a scoping review by K. Zhang & Thompson (2023), sought to identify changes in behavior after healthcare disciplines participate in online continuing interprofessional education. Of the studies included in this review, 93% reported positive changes in behavior regarding patient care practices in healthcare providers (K. Zhang & Thompson, 2023).

Additionally, the findings of a study by Lineker et al. (2019) supports the conclusion that knowledge gained while participating in online learning improves clinical care among healthcare providers, including OTPs. Among the other participants of this study, OTPs reported improvement in satisfaction and confidence in their ability to manage care for individuals with arthritis after completing an online program (Linker et al., 2019). In accordance with these articles, Phillips et al. (2021) conducted a study on the effectiveness of an online education program for OTPs working in bariatric care and concluded that participants' self-perception of competence and knowledge among this population significantly improved ( $p < .05$ ).

The articles identified by this literature review found that online learning leads to positive outcomes such as improved clinical care, increase in knowledge, and improved access to education (Bragg et al., 2021; Lineker et al., 2019; Phillips et al., 2022; Ramsden et al., 2022; K. Zhang & Thompson, 2023). Though these articles are not all directly related to occupational therapy and AT, the results can be translated to support the effectiveness of an online PD course for OTPs who are interested in learning more about AT for computer access.

Of the studies found to answer the first research question, 40% of the articles were pre- and post-surveys that were completed prior to the participant's engagement in the training, as well as upon completion of the training (Lineker et al., 2019; Phillips et al., 2022). These surveys also identified a significant clinical and professional change in healthcare professionals. The remaining studies were systematic reviews that concluded that online learning has a positive effect on a healthcare professional's clinical care and

learner's satisfaction (Bragg et al., 2021; Ramsden et al., 2022; K. Zhang & Thompson, 2023). Approximately 80% of the articles found focused on healthcare professionals and online learning (Lineker et al., 2019; Phillips et al., 2022; Ramsden et al., 2022; K. Zhang & Thompson, 2023), while the remaining articles did a comprehensive review of the literature that focused on the development of teachers (Bragg et al., 2021). Occupational therapy practitioners were only included in two of the five articles found (Lineker et al., 2019; Phillips et al., 2022).

### ***Effective Active Learning Strategies of Online Learning***

Research suggests that an online PD learning opportunity that includes multimodal approaches such as videos, case studies, real-time engagement with experts, illustrations/graphics, and quizzes were effective types of active online learning (Bragg et al., 2021; DeSouza et al., 2020; Lineker et al., 2019; Phillips et al., 2022; Ramsden et al., 2022). In the systematic review completed by Bragg and colleagues (2021), over 54% of articles identified that practical, hands-on activities and real-life observations in the online learning materials were effective in improving knowledge and other positive outcomes for primary and secondary education teachers. The study conducted by Phillips et al. (2021) previously discussed also supports the effectiveness of online learning, as the authors concluded that the use of case studies, video clips, diagrams/illustrations, and quizzes significantly improved the knowledge of the OTPs learning about bariatric care ( $P=0.00001$ ). Similar to Phillips et al. (2021), DeSouza and colleagues (2020) conducted a mixed method study and concluded that the use of multimodal forms of online learning such as videos, animations, quizzes, case studies, and clinical discussions improve

participant satisfaction. Additionally, Lineker et al. (2019) determined the use of case studies presented by text, audios, videos, graphics, and external resources in an online learning program to be an effective method to improve healthcare staff's confidence when working with persons with dementia.

Most of the articles identified by this literature review utilized surveys to identify the effectiveness of their modes of online learning (DeSouza et al., 2020; Lineker et al., 2019; Phillips et al., 2022). The remaining articles completed scoping and systematic reviews that identified articles and effective modes of online learning (Bragg et al., 2021; Ramsden et al., 2022). The participants of two of the five studies included OTPs (Lineker et al., 2019; Phillips et al., 2019) and the remaining studies consisted of articles that focused on healthcare professionals and/or teachers. (Bragg et al., 2021; DeSouza et al., 2020; Ramsden et al., 2022). All of these articles identified positive outcomes such as improvement in participant satisfaction, engagement and clinical knowledge while using case studies, peer and expert engagement and interaction, videos, text and pictures to present the information.

### ***Online Learning for OTPs on AT***

A comprehensive review of the literature determined that online learning was an effective platform for OTPs to learn about AT. The articles identified by this literature review concluded that participation in online learning improves clinician's practice skills, understanding and application of AT, ability to identify persons who would benefit from use, self-proficiency, and confidence (Atanga et al., 2020; Haynes, S., 2013; Kuok et al., 2023; Múnera et al., 2021; Worobey et al., 2022). According to the survey study

conducted by Kuok et al. (2023), improvements were noted in a post-survey of OTP mentors after implementation of online learning with the most notable improvements in professional network, interest in AT and job satisfaction. The case study by Haynes (2013) also found that 88% of AT specialists, including OTPs, who attended the training on AT reported that the course improved their understanding and application of AT and they were more likely to recommend AT to their patients. Additionally, the findings of the study by Atanga et al. (2020) support the conclusion that training and PD opportunities improved participant's knowledge in AT ( $p < .01$ ). Though the participants of this study were teachers, the results can likely be transferred to other professionals who use AT as an intervention within their scope of practice, including OTPs. More specifically, studies by Múnera et al. (2021) and Worobey et al. (2022) support the effectiveness of online learning for OTPs and AT. According to Múnera et al. (2020), graduate and undergraduate students with experience in working with wheelchairs, reported an increase in confidence ( $p < 0.05$ ) and overall capacity ( $p < 0.05$ ) in their ability to manage wheelchairs. Though this article is not directly related to AT for computer access, wheeled mobility is also defined as an "intervention to support occupations" in the 4<sup>th</sup> edition of the Occupational Therapy Practice Framework (OTPF-4), therefore making the findings generalizable (AOTA, 2020). The cohort study by Worobey et al. (2022) also identified that physical therapists and OTPs reported improvement in capacity ( $p < 0.0001$ ) and confidence ( $p = 0.0003$ ) in wheelchair skills after participating in an online learning opportunity, thus providing additional evidence that learning online from an expert helps to improve a clinician's knowledge and ability to utilize AT in their



interventions.

The studies found by this literature review were mostly surveys of clinicians interested in learning more about AT (Atanga et al., 2020; Kuok et al., 2023; Múnera et al., 2021; Worobey et al., 2022) and one case study (Haynes, S., 2013). Though four out of the five articles included healthcare professionals (Haynes, S., 2013; Kuok et al., 2023; Múnera et al., 2021; Worobey et al., 2022), one article focused on teachers as the primary population studied (Atanga et al., 2020). Only one study included the perspective of the educator (Kuok et al., 2023). Of the articles included in this review, 80% were published in the United States and one was published in Australia (Kuok et al., 2023), thus supporting the effectiveness of hosting an online learning opportunity within the United States (Atanga et al., 2020; Múnera et al., 2021; Worobey et al., 2022).

### **Implications for Program**

Online learning allows for significant improvements in awareness of topics presented, clinical knowledge, learner's satisfaction, patient centered care, access to education, and interdisciplinary collaboration (Bragg et al., 2021; Lineker et al., 2019; Phillips et al., 2022; K. Zhang & Thompson, 2023). *Upd(AT)e* will be presented in online format to allow for flexibility of schedule and access to education for those OTPs who are otherwise unable to attend PD opportunities due to geographical barriers. This program also aims to utilize the findings of this literature review to improve OTPs' perceived level of clinical knowledge, satisfaction, and awareness of the benefits of AT for computer access.

The research identified by this literature review unanimously supports the use of a multimodal approach when designing an online PD program. Effective active learning strategies included case studies, peer and expert engagement, videos, text and pictures to present information. (Bragg et al., 2021; DeSouza et al., 2020; Lineker et al., 2019; Phillips et al., 2022; Ramsden et al., 2022). Given the abundance of evidence, *upd(AT)e* will use case studies, videos and text and pictures to educate the learners and improve their experience as studies have shown that when information is presented in these modes, learners are more likely to be satisfied and feel more confident in their skills (Bragg et al., 2021; DeSouza et al., 2020). Though these articles were not directly related to AT, the results of these studies support the methods in which the content of the modules of *upd(AT)e* are presented.

Online learning opportunities for OTPs for AT are effective in improving practice skills, knowledge and confidence (Atanga et al., 2020; Kuok et al., 2023; Múniera et al., 2021; Worobey et al., 2022). Using the findings of these studies, *upd(AT)e* incorporates case studies, presentations with text and links to outside resources, and videos to optimize knowledge and awareness of AT, and improve learner outcomes and satisfaction.

## **Conclusion**

With this literature review, it can be concluded that if OTPs participate in an online learning opportunity on AT, then their knowledge of AT will improve. Online learning PD opportunities for OTPs for AT are effective in improving practice skills, knowledge and confidence (Atanga et al., 2020; Kuok et al., 2023; Múniera et al., 2021;

Worobey et al., 2022). The evidence found by this literature review was used to develop a comprehensive online program that improves OTP's utilization and recommendation of AT for computer access in their interventions for persons with neurological diagnoses. The educational content of this program will support the advanced learning of OTPs of AT for computer access through online learning modules, access to experts in the field of AT and case examples of application of skills and knowledge gained.

## **CHAPTER FOUR – Description of the Proposed Program**

### **Basis of the Proposed Program**

*Upd(AT)e* is an online professional development (PD) program intended for OTPs (OTPs) to gain knowledge and improve their confidence in utilizing and recommending assistive technology (AT) for computer access in their interventions for persons with neurological diagnoses. This PD program will be open to OTPs of all experience levels from new graduates to seasoned clinicians who are interested and willing to advance their knowledge about AT for computer access. Participants of this program will have the opportunity to learn from experts in the field about how AT for computer access can assist persons with neurological diagnoses to access their computers to engage in meaningful tasks more independently.

All occupational therapy (OT) graduate programs must follow curriculum standards set by the Accreditation Council for Occupational Therapy Education (ACOTE). The primary standard linked to AT mandates all Doctoral and Master's entry-level therapists must be able to evaluate, design, fit and fabricate AT (2018, ACOTE). Based on this standard, occupational therapy assistants (OTAs) are required to complete the same tasks under the supervision of a licensed OTP. Though this is a requirement, the amount and quality of education of AT varies among entry-level curriculums (Long et al., 2007). Due to the variation in curriculum design among institutions, studies have shown that practicing OTPs do not feel comfortable in utilizing and recommending AT for computer access and wish that training of AT for computer access was more incorporated into their entry-level curriculum (Dishman et al., 2021; Manship et al., 2024).

The provision of AT is a multidisciplinary process; however, OTPs offer a unique skillset as they provide rationale for the use of AT and how it allows patients to engage in meaningful activities (Long et al., 2007). However, as discussed in earlier chapters, many therapists do not feel they received adequate training using AT and therefore do not feel comfortable or proficient in recommending AT for their patients (Dishman et al. 2021). This leads to a gap in knowledge of resources of available AT to assist patients in their ability to access their computers and engage in meaningful social occupations. *Upd(AT)e* aims to improve OTPs' comfort with recommending AT and improving confidence when utilizing this unique intervention.

*Upd(AT)e* is an eight-hour, synchronous, online PD program hosted via Zoom that will be divided into three modules. The purpose of this program is to bridge the gap between entry-level curriculums and clinical interventions in the field. This program focuses on improving OTPs' comfort with utilizing and recommending AT for computer access for persons with neurological diagnoses. Participants will learn of the benefits of AT for computer access. Module content of *upd(AT)e* seeks to educate the participants on the different types of AT for computer access, present current accessibility options on personal devices and introduce case studies to apply the knowledge learned. The primary program instructors and coordinators include OTPs who are also certified assistive technology professionals (ATPs). Learning activities within the modules will include pictures, videos, tests of knowledge and case studies. During the case studies, participants will collaborate with each other, as well as the course facilitators as a form of mentorship, to problem solve an access issue using the skills they learned throughout the course.

### ***Problem Addressed by Program***

According to Arthanat et al. (2017), 64.8% of the AT providers surveyed (including OTPs) felt their entry-level training of AT was inadequate. More specifically, the survey conducted by Dishman et al. (2021), OTPs felt that their entry-level education did not prepare them to incorporate AT into their therapeutic interventions. In this study, 67% of the OTPs reported they would like additional AT training during their entry-level curriculum. Similarly, in an earlier study by Gitlow and Sandford (2003), the authors found that more than 77% of AT practitioners felt they needed more training on resources and information for AT funding. These authors also found that practitioners only felt comfortable utilizing AT to assist with completing activities of daily living (ADLs). Aside from a gap in the education or training provided in entry-level programs, an additional barrier of utilizing AT is the lack of training or education provided to established healthcare professionals (Howard et al., 2022). This study also found that AT users reported that healthcare professionals were not up to date on emerging technologies and how to properly use the devices (Howard et al., 2022). Participants of *upd(AT)e* will engage with and learn from experts in the field of AT to address these barriers identified in the literature. The content presented in the program is intended to decrease OTPs discomfort with use of AT and provide additional training and education on current resources available.

### ***Review of the Explanatory Model***

The creation of the *upd(AT)e* online professional development course is influenced by Social Cognitive Theory (SCT) and the Human, Activity and Assistive Technology (HAAT) model. The combination of these two models helped to create course content that considers the participant's motivation and drive to learn more about AT when interacting with mentors and experts within an online context.

Social Cognitive Theory focuses on the effect the social environment has on learner's motivation, learning and self-regulation (Schunk & DiBenedetto, 2020). The six constructs of the SCT include reciprocal determinism, behavioral capability, observational learning, reinforcements, expectations, and self-efficacy (LaMorte, 2022).

*Upd(AT)e* applied the concepts of reciprocal determinism, observational learning and self-efficacy to the course curriculum to improve the OTP's learning experience, as well as to improve their confidence and comfort in utilizing and recommending AT for individuals with neurological diagnoses. This program uses the observational learning aspect of the SCT to promote a positive learning environment that enables learners to actively engage with educators and other experts of AT. *Upd(AT)e* also considers the learner's motivation to improve their knowledge of AT for computer access. This program provides an enriching learning environment with models and mentors, thus will have a positive influence on participants behavior. This positive influence, known as reciprocal determinism, will aid in motivating the participants to learn more and actively participate (LaMorte, 2022). When OTPs participate in *upd(AT)e*, they will experience increases in motivation and self-efficacy, thus improving the frequency and quality of

their utilization and recommendation of AT for computer access.

The HAAT model consists of human, activity, AT and the context (Giesbrecht, 2013; Cook & Polgar, 2015). This model explores the influence that each construct has on one another and how each affects a person's ability to carry out a meaningful task (Giesbrecht, 2013). Similar to the SCT, this theory highlights the importance and influence of the influence on outcomes. This interactive relationship is also important for learners to understand as it helps to influence the OTP's decision-making process in recommending the appropriate AT. *Upd(AT)e* utilizes this model within the three educational modules to ensure that the participants (human) are effectively learning (activity) using assistive technology (the personal devices used) within an online forum (context). This model not only influences the OTPs within this course, but also the patients that they will serve upon the completion of the course. If OTPs utilize and recommend AT for computer access, then more people with neurological diagnoses will be better able to access their personal devices and participate in meaningful activities in any context.

### ***Key Stakeholders and Intended Users of Program***

The primary stakeholders of *upd(AT)e* at the micro level are OTPs who are attending the course and patients with neurological diagnoses. Other key stakeholders include the representatives from the major technology companies and representatives from the American Occupational Therapy Association (AOTA) who work with professional development opportunities and advocacy for policy changes.

Occupational therapy practitioners who participate in this program are one of the



primary stakeholders as they will translate and carryover the knowledge gained in the program and provide evidence-based care to persons with neurological diagnoses into their clinical settings. When considering persons with neurological diagnoses as micro level stakeholders, it is important to note they will be directly influenced by the OTPs and their knowledge gained from this program. After receiving treatment and care from the OTPs who attended *upd(AT)e*, these stakeholders will be able to more independently access their personal devices and participate in meaningful activities.

Patients with neurological diagnoses and OTPs who attend *upd(AT)e* will help to determine the successful implementation of the program and offer suggestions for areas of improvement. These stakeholders at the micro level will have the opportunity to meet with other stakeholders of *upd(AT)e* from the meso and macro level to ensure course content is up to date and relevant to the learners. This meeting will be described more in Chapter Five.

Representatives from AOTA's Approved Provider Program will review the course content to warrant that the course meets their continuing education requirements. The program evaluation of *upd(AT)e* will also provide the AOTA with data necessary to represent the occupational therapy profession at a macro level to propose and justify policy changes for insurance coverage of AT.

**Figure 4.1***Program Practice Scenario*

Scarlett is an OTP who graduated with her Master's degree and has over eight years of clinical experience. She began her career in a private charter school and recently started a new job in an outpatient neurological rehabilitation center for adults and children. This facility serves patients of all ages with a variety of neurological diagnoses including but not limited to cerebral vascular accident (CVA), traumatic brain injury (TBI) and spinal cord injury (SCI). One day, Scarlett completed an evaluation for a 16-year-old female with a cervical-level SCI that affects the patient's ability to effectively use her upper extremities. The patient told Scarlett that she wanted to be able to use her computer so she can engage with her friends through social media. Though Scarlet is an experienced clinician, she does not feel well equipped to address her patient's goal. Scarlet remembered she had a class on AT during her entry-level education, but cannot recall content specific to this patient's needs. posts more independently. Scarlett's patient reports increased satisfaction with her life as she is more independent and is better able to socialize with her friends, minimizing her feelings of isolation. Scarlett's confidence in recommending AT significantly improved and she plans to continue to utilize the skills she learned from attending *upd(AT)e* for future patients who may benefit from AT for computer access.

She searched professional websites for possible online PD opportunities, as her schedule does not have flexibility for travel. Scarlett finds *upd(AT)e* on AOTA's continuing education website and attends the course. After attending the one-day online course, Scarlett incorporates the knowledge she gained to utilize and recommend AT in her interventions with her patient. She introduces her patient to built-in accessibility options such as assistive touch, voice control, and Dwell click. She also tried the use of alternative hardware with her patient, such as a joystick mouse and a head mouse. After 10 sessions of OT, Scarlett's patient achieves her goal and reports she is able to scroll through her social media platforms and "like" her friends posts more independently. Scarlett's patient reports increased satisfaction with her life as she is more independent and is better able to socialize with her friends, minimizing her feelings of isolation. Scarlett's confidence in recommending AT significantly improved and she plans to continue to utilize the skills she learned from attending *upd(AT)e* for future patients who may benefit from AT for computer access.

### ***Objectives of the Program***

The author intends to address this scenario by providing an online PD opportunity for OTPs to improve their confidence and knowledge in utilizing and recommending AT for computer access. *Upd(AT)e* will expand on the general education OTPs received in their entry-level curriculum and focus more specifically on AT for computer access. This course will increase awareness of the benefits of AT for computer access, thus serving more people in need. An increase in awareness of AT has the potential to lead to positive

changes in government policies, specifically for insurance coverage and other funding resources of AT. By the end of this program, participants will meet the following objectives:

- Participants will be able to explain at least three benefits of AT and computer access confidently to their colleagues, patients, and patient's families.
- Participants will identify two hardware and two software alternative methods for computer access for persons with neurological diagnoses.
- Participants will be able to accurately select appropriate AT for computer access when presented with a case study of a person with a neurological diagnosis to improve patient participation in meaningful instrumental activities of daily living (IADLs).

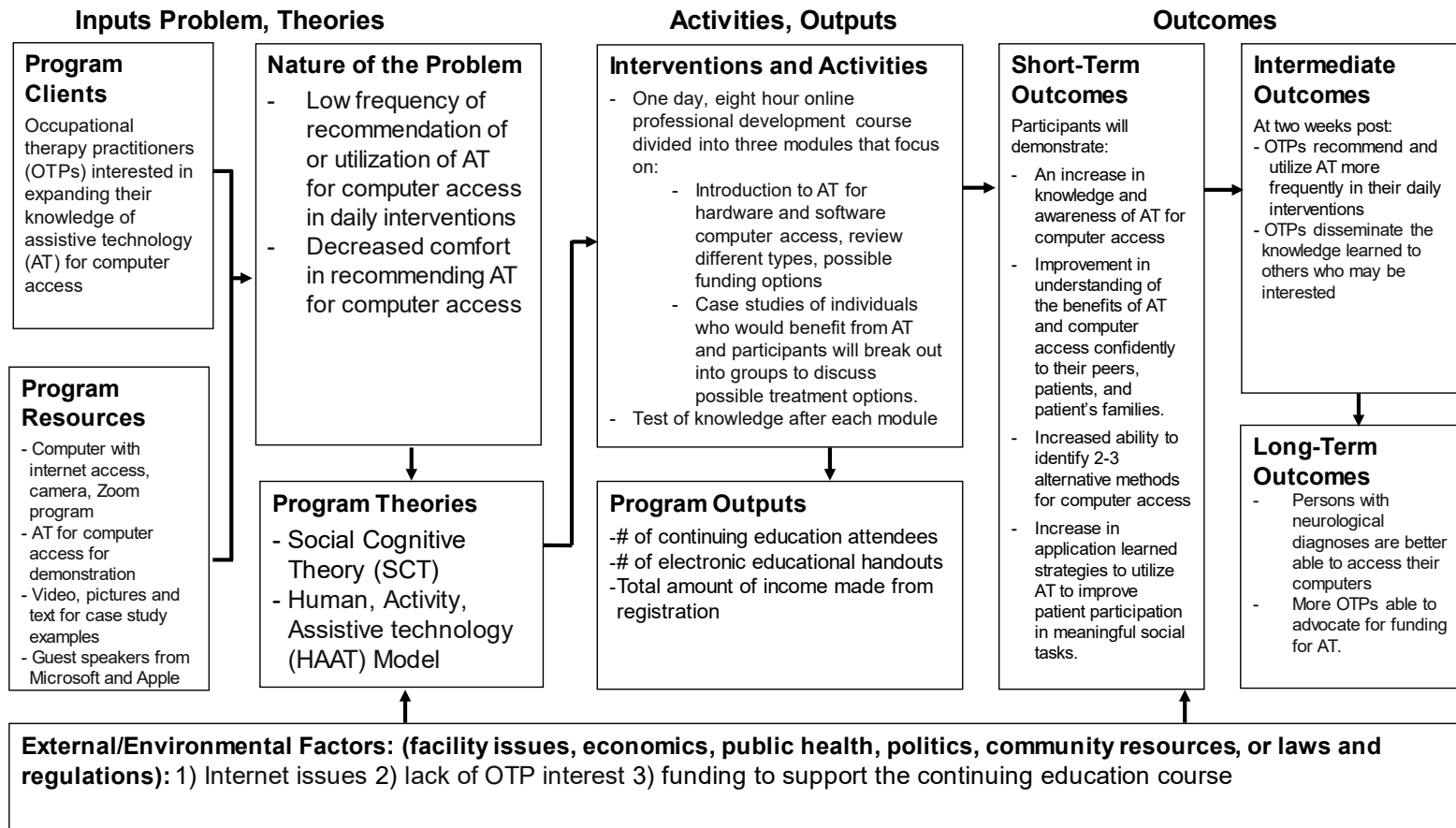
### **Full Logic Model**

Figure 4.2 is the full logic model diagram for the program which illustrates how the resources and activities are intended to lead to the identified outcomes.

**Figure 4.2**

*Full Logic Model*

**Program title:** *upd(AT)e: An online continuing education course to improve OT practitioner comfort with utilization and recommendation of Assistive Technology (AT) for computer access.*



## **Program Participants and Resources**

### ***Intended Program Participants, Personnel and Setting***

The intended audience of the *upd(AT)e* program include OTPs who are interested in expanding their knowledge of AT for computer access. The course content presented would be most beneficial for those clinicians who consider their knowledge of AT to be beginner or novice level, however, OTPs of all levels are invited to attend. Participants will be recruited by word-of-mouth networking, email blasts, AOTA and Rehabilitation Engineering Society of North America (RESNA) professional development forums.

*Upd(AT)e* will be planned and carried out by the author, as well as two other OTPs who are experts with over five years of in using AT for computer access with adult and pediatric patients. The responsibilities of coordinating meetings with stakeholders and guest speakers, advertising the course, and organizing presentation content will be split among the three OTPs. The author of this project will be responsible for teaching the other two OTPs the course content to ensure integrity and fidelity of the program are maintained. Refer to Table 4.1 below to review the associated personnel and their role in *upd(AT)e*.

*Upd(AT)e* will be delivered synchronously and virtually to participants, with the course facilitators of the professional development course presenting live together from a conference room. The decision to deliver the course virtually will allow for a flexible schedule for both course facilitators and participants. The OTPs who are hosting and presenting *upd(AT)e* will require a large room with enough space to hold the AT for computer access. Additionally, they will need a computer with internet access, the Zoom

application, and a working camera.

**Table 4.1**

*Role of Personnel*

<b>Personnel</b>	<b>Role</b>
Author: Camille-Anne Peredo, MS, OTR/L, CBIS, ATP	Review of course content, communication with guest speakers, oversee marketing, presenter, reviewer of data from pre/post surveys and feedback forms
Clinical Support: Two OTPs with clinical experience with AT for computer access	Review of course content, presenter, data collector/reviewer of quizzes
Administrative Support	Coordination of registration, operational e-mail correspondence, full overview of Zoom application operations (break out rooms, chat, sharing of screen, etc.)
Information Technology Support	Support for technical needs of the presenters, guest speaker and course coordinators

***Plan for Outreach***

In order for this program to attract potential participants of *upd(AT)e*, the program coordinators will send out emails, post on public forums on AOTA, and RESNA, and on social media. Additionally, an initial anonymous needs assessment survey conducted by this author serves as a foundation for potential participants. Results of this survey concluded that more than 50% of the participants indicated that continuing education courses were not easily accessible to them. Therefore, the marketing handouts for *upd(AT)e* will be re-sent and reposted to the same forums in effort to reach those individuals who may be interested in participating in the program.

Table 4.2 below identifies the form of outreach and what information will be provided in order to properly advertise and market the course.

**Table 4.2**

*Marketing Plan*

<b>Form of Outreach</b>	<b>Action</b>
AOTA	Post informational handout on CommunOT
RESNA	Post on public listserv
Social Media	Send handout to relevant AT groups and companies, use hashtags
Large Urban Adult Hospitals	Email blast to all OTPs sent by clinical directors of occupational therapy
Email	Send email to original recipients of needs assessment survey and encourage recipients to forward the information to others who may be interested.

**Intervention and Activities**

*Upd(AT)e* is a PD program that is divided into three modules. These three modules focus on an introduction to AT for computer access, with focus on mainstream hardware and software available and provide an opportunity to apply learned skills and knowledge in real-time through case studies. During Module Three, participants will have the opportunity to collaborate with one another as well as the course coordinators who are experts in AT in breakout rooms. Participants may ask course coordinators specific questions, as well as for guidance to problem solve giving them the opportunity to learn from mentors in a smaller group. Refer to Table 4.3 for a comprehensive overview of content within each module.



**Table 4.3***Course Content*

<b>Module</b>	<b>Content</b>
<b>Module One: Introduction to AT for computer access</b>  Presented by the author and two OTPs with experience in AT	I. Introduction <ul style="list-style-type: none"> <li>a. Pre-test survey via quick response (QR) code</li> <li>b. Presenters</li> <li>c. Objectives of Course</li> </ul> II. Different types of AT for Computer Access <ul style="list-style-type: none"> <li>a. What is AT? <ul style="list-style-type: none"> <li>i. Definition</li> <li>ii. Who would benefit from AT?</li> </ul> </li> <li>b. Low, mid, high tech <ul style="list-style-type: none"> <li>i. Examples</li> </ul> </li> <li>c. Access Methods <ul style="list-style-type: none"> <li>i. Direct selection</li> <li>ii. Indirect selection</li> </ul> </li> <li>d. Hardware <ul style="list-style-type: none"> <li>i. Adaptive Mice</li> <li>ii. Joystick Mouse</li> <li>iii. External trackpad</li> <li>iv. Head Mouse</li> <li>v. Eye Gaze</li> <li>vi. Adaptive Keyboard</li> <li>vii. Mini keyboard</li> <li>viii. On-screen keyboard</li> <li>ix. Large keyboard</li> </ul> </li> <li>e. Resources <ul style="list-style-type: none"> <li>i. Community</li> <li>ii. Lending libraries</li> <li>iii. Grants</li> <li>iv. Donation</li> <li>v. Insurance</li> </ul> </li> </ul> III. Test of Knowledge/Quiz
<b>Module Two: Software Technology Resources (2 hours total)</b>	I. Review of iOS operating system accessibility options  II. Review of Windows operating system accessibility options

Presented by representative from each respective company	III. Test of Knowledge/Quiz
<b>ONE-HOUR LUNCH BREAK</b>	
<b>Module Three: Case Studies</b>	I. Introduction to Case Study #1
Learning activity facilitated and mentored by author and OTPs with experience in AT.	a. Share video
	b. Breakout rooms
	c. Participants share proposed treatment plan/intervention
	IV. Case Study #2
	a. Share narrative with pictures
	b. Breakout rooms
	c. Participants share proposed treatment plan/intervention
	V. Question and Answer (15 minutes)
<b>Module Four: Conclusion</b>	I. Speaker Contact Information
Presented by this author	II. Next Steps
	III. Post-test Survey via QR code
	IV. Closing Remarks

### ***Length and Frequency of Program***

*Upd(AT)e* is a one-day, eight-hour, synchronous online course offered twice a year. Table 4.4 describes an overview of the course schedule, including the duration of each module and each subsection of the module.

**Table 4.4***Course Schedule*

Schedule	Time Spent	Activity	Content
Module One (Three hours total)			
8:00AM–8:15AM	15 minutes	Introduction	<ul style="list-style-type: none"><li>• Pre-test Survey</li><li>• Introduction to presenters</li><li>• Getting to know one another/ice breaker</li></ul>
8:15AM–9:45AM	1 hour and 30 minutes	Clinical Presentation	<ul style="list-style-type: none"><li>• What is AT?</li><li>• What are the different types of AT?</li><li>• Low, mid, high-tech AT</li><li>• Access Methods</li></ul>
9:45AM–10:00AM	15-minute break		
10:00AM–11:30AM	1 hour and 30 minutes	Clinical Presentation	<ul style="list-style-type: none"><li>• Hardware</li><li>• Resources</li><li>• Quiz</li></ul>
11:30AM–11:45AM	15-minute break		
Module Two (Two hours total)			
11:45AM–12:45PM	1 hour	Clinical Presentation	<ul style="list-style-type: none"><li>• Review of iOS operating system accessibility options</li><li>• Questions and Answers</li></ul>
12:45PM–1:45PM	One- hour lunch break		
1:45PM–2:45PM	1 hour	Clinical Presentation	<ul style="list-style-type: none"><li>• Review of Windows operating system accessibility options</li><li>• Questions and Answers</li></ul>
2:45PM–2:50PM	5 minutes	Test of Knowledge	<ul style="list-style-type: none"><li>• Quiz</li></ul>

2:50PM– 3:00PM	10-minute break		
<b>Module Three (1.5 hours total)</b>			
3:00PM– 3:30PM	30 minutes	Case Study #1	<ul style="list-style-type: none"><li>• Video</li><li>• Breakout room</li></ul>
3:30PM– 3:45PM	15 minutes		<ul style="list-style-type: none"><li>• Discussion</li></ul>
3:45PM– 4:15PM	30 minutes	Case Study #2	<ul style="list-style-type: none"><li>• Reading</li><li>• Breakout room</li></ul>
4:15PM– 4:30PM	15 minutes		<ul style="list-style-type: none"><li>• Discussion</li></ul>
<b>Conclusion (30 minutes total)</b>			
4:30PM– 5:00PM	30 minutes	Presentation	<ul style="list-style-type: none"><li>• Course presenter information</li><li>• Closing remarks</li><li>• Final questions and answers</li></ul>

## Program Outputs and Outcomes

### *Outputs*

*Upd(AT)e* is intended to create quantitative outputs in order to identify the effectiveness of the program. Quantitative data will be demonstrated by the number of course registrants and participants, number of fact sheets distributed, number of electronic educational handouts provided, and the total number of income earned from registration. Qualitative outputs will also be produced in this program through course satisfaction surveys and feedback for improvement for future courses. These surveys will be provided pre- and post-participation in the program.

### ***Short- and Long-Term Outcomes***

This program will yield positive short-term, immediate and long-term outcomes. Immediately upon completion of the course, short-term outcomes include an increase in OTP knowledge and awareness of AT for computer access and an improvement in confidence in explaining the benefits of AT and computer access confidently to their peers, patients, and patient's families. Additional short-term outcomes included increased ability of OTPs to identify appropriate methods for computer access based on the patient's needs, and an increase in OTPs application of learned strategies to utilize AT to improve patient participation in meaningful social tasks. Intermediate outcomes of *upd(AT)e* are anticipated to occur two to four weeks after participation in the course. These outcomes include an increase in OTP recommendation and utilization of AT frequency in daily interventions and an increase in OTP's dissemination of knowledge to others who may be interested. Long-term outcomes include an improvement in access to AT interventions for computer access for persons with neurological diagnoses and an increase in OTP advocacy for funding for AT.

### **Anticipated Barriers and Challenges**

Despite the anticipated success of *upd(AT)e*, barriers that may influence the development of this program must be acknowledged. These include lack of OTP awareness of the course, lack of OTP interest in taking the course, and inconvenient scheduling. The author has attempted to mitigate these barriers by providing a flyer on the benefits of AT for computer access (see Appendix A). This flyer will succinctly educate OTPs on AT, specifically for computer access and will also have information

regarding the course. This handout will be advertised on AOTA, RESNA and via email blast to help increase awareness of the availability of the course. This author recognizes that the original scheduled time may not be optimal for some potential participants, so this course will be offered bi-annually and the schedule will be considerate of different time zones.

### **Summary and Conclusions**

*Upd(AT)e* is a professional development opportunity for OTPs who are motivated to learn more about AT for computer access. The literature reviews described in Chapters Two and Three and the survey completed by this author identified that the lack of post-educational training is impacting the frequency in which AT is utilized and recommended by OTPs. This in turn is affecting the care of persons with neurological diagnoses. This author and course facilitators of *upd(AT)e* will present information on different types of AT and how it can be used for computer access, built-in accessibility options on personal devices, and provide case studies to allow for learners to apply learned skills.

The course content and method of presentation of the *upd(AT)e* program was influenced by the SCT theory and the HAAT model as these models explore the importance of environment in an individual's success. With these models and the support of the research identified by the literature reviews and the authors needs assessment survey, *upd(AT)e* aims to improve OTPs comfort in utilizing and recommending AT for computer access for their patients with neurological diagnoses.

## CHAPTER FIVE – Program Evaluation Research Plan

### Program Overview

*Upd(AT)e* is a one day, eight-hour, synchronous online professional development (PD) course that aims to increase occupational therapy practitioners' (OTPs) comfort with utilization and recommendation of assistive technology (AT) for computer access for persons with neurological diagnoses. Studies have shown that OTPs do not feel prepared to utilize AT in their interventions (Dishman et al., 2021). As a result, *upd(AT)e* was designed to address this problem by providing an opportunity for OTPs to learn online about AT. In addition, this course was created to overcome the barriers of lack of availability, inconvenient scheduling, and geographical location of educational courses for AT identified in previous chapters. With this program, participants will have the opportunity to learn from AT experts on available hardware and software and apply the learned knowledge to clinical scenarios.

The primary stakeholders for the program evaluation of *upd(AT)e* include community OTPs, community OTPs who are also certified assistive technology professionals (ATPs), the course facilitators who are OTPs and AT experts, participants of the course, persons with neurological diagnoses, members of the American Occupational Therapy Association's (AOTA) Approved Provider Program. The community OTPs and OTPs who are ATPs will be involved in the needs assessment for course content. The course facilitators will be directly involved with program delivery. The remaining stakeholders are interested in the course content to ensure the program is meeting its objectives and maintaining fidelity.

**Figure 5.1***Practice Scenario*

Leonardo is an OTP who has worked in an outpatient therapy clinic within a hospital for adults and children with neurological diagnoses for six months. He had the opportunity to observe more experienced OTPs work with individuals with neurological diagnoses. Leonardo evaluated a 48-year-old female with multiple sclerosis who reports difficulty typing on her computer. The patient reported her goal as, “to be able to type an e-mail without difficulty.” Leonardo remembered that he attended a class during his entry level education that introduced him to AT and alternative methods to access a computer. He reached out to his colleagues with more experience who recommended he attend *upd(AT)e*. This online PD program educates the participants on different methods of alternative computer access and provides opportunities for the participants to engage with experts of AT and other OTPs interested in learning about AT. Leonardo attends *upd(AT)e* through the Zoom online platform and learns about AT for computer access, about cutting-edge technology and accessibility options on mainstream technologies. Within this course, Leonardo has the opportunity to collaborate with other OTPs and experts in the field to apply their learned knowledge to two case studies. This one-day course is optimal for Leonardo’s schedule as he does not have to travel, and he does not need to take off more than one day of work. After the course is complete, Leonardo sends e-mails to the course facilitators with specific case examples and questions regarding his 48-year-old patient with multiple sclerosis. With the help of the experts and his participation in *upd(AT)e*,



Leonardo feels more comfortable in utilizing and recommending AT. He is able to teach his patient with MS how to use AT to access her computer and be more efficient with writing emails. At the end of this patient's plan of care, she is able to type e-mails with less difficulty and built her toolbox for other AT available for her use when she has flare ups.

## **Vision**

The purpose of this program evaluation is to determine the effectiveness of *upd(AT)e*, and to evaluate the feasibility, utility, and participant satisfaction with the program. With this research and the findings of the independent survey conducted by this author, the course coordinator intends to use the results of this program evaluation to improve future participants' learning experience by ensuring that the course content is up to date and is delivered effectively. The overarching aims of this program evaluation include:

- To improve course content and delivery of information of AT for computer access
- To support the effectiveness of online learning in educating OTPs on AT for computer access
- To improve participant's knowledge, skill, and confidence with use of AT for computer access

The evaluation of *upd(AT)e* will use summative and formative approaches. The findings from this program evaluation will add to the existing literature in support of the benefit of online PD for AT for computer access. Persons with neurological diagnoses

will also benefit from this program evaluation as it will improve clinical care, allowing OTPs to better meet the needs of this population. As discussed in Chapter Two and as identified by the needs assessment conducted by this author, most clinicians do not feel that their entry-level education prepared them to adequately utilize and recommend AT for computer access in their interventions. If an OTP attends this program, then the gap in knowledge may be filled as they are more aware of the benefits and availability of AT for computer access. Participants of this course may be professors or educators with influence on the entry-level curriculum of OTPs. If their knowledge and awareness of AT for computer access increases, then they may be able to include this information more appropriately into the entry-level curriculum. This evaluation will provide information regarding the effect of the course content on the participant's level of confidence in utilizing and recommending AT for computer access.

The findings of this program evaluation will also influence how future sessions are organized. The results will identify opportunities for improvement in course material and presentation of educational topics to optimize the learner's experience. As discussed in Chapter Three, online learning fosters positive outcomes and helps to overcome geographical barriers for the learner. This evaluation will allow for course facilitators to tailor their presentation to meet the needs and expectations of the participants.

The short-term outcomes of this program include reports of an increase in knowledge and awareness of AT for computer access, as well as an improved understanding of AT for computer access. Upon completion of *upd(AT)e*, participant's will also demonstrate an increased ability to identify different types of AT for computer

access, and apply learned information. These short-term outcomes will lead to the overall long-term outcome of OTPs, which will also assist in meeting the needs of persons with neurological diagnoses by improving their ability to access their computers. This increase in OTP knowledge and awareness may also lead to improvements in policies regarding AT funding.

### **Engagement of Stakeholders**

The engagement of stakeholders will vary depending on how they are involved in program development. Community OTPs and community OTPs who are certified ATPs will participate in a survey to determine the needs for this course. The results of this survey will help to influence the course content. Occupational therapy practitioners who are interested in learning more about AT for computer access will help determine the effectiveness of this program. They will complete a pre- and post-test to assess knowledge gained and other improvements in comfort and skill. The post-test will also include a survey to give participants the opportunity to provide feedback on how the course content was presented, and other areas of improvement. Semi-structured interviews will also be completed to identify if participants have specific interests of successful implementation, advocacy for the AT policy changes, and overall access to PD opportunities. Participants will also receive a survey six months after completing the course to determine if skills were maintained and to provide additional feedback on the course.

Persons with neurological diagnoses are also stakeholders for the program evaluation of *upd(AT)e* as OTPs who attend this course will take their knowledge and skills acquired and apply it to their daily practice. These skills will help persons with neurological diagnoses meet their goals. Participants of this course will report on their experiences of patient success in the 6-month follow up post-survey.

Other stakeholders whose involvement is critical for the successful completion of this study are curriculum representatives from AOTA's Approved Provider Program. These representatives will utilize the program evaluation results of *upd(AT)e* to ensure that the goals align with best practice, as well as meet the specific criteria required for continuing education credits. These representatives will participate in planning and reflecting as they have strong influences on policy changes, patient advocacy and access to continuing education units (CEUs). They will also serve as consultants for course content and presentation.

The participants will incorporate the information and knowledge gained into their daily practice by educating potential users as well as their colleagues on available options to improve access and independence when participating in meaningful activities. These representatives assist with planning, implementation and reflection of *up(AT)e*. They will review course content, implementation of interventions, and dissemination of information. Table 5.1 identifies each stakeholder and stakeholder group and identifies their role in program evaluation.

**Table 5.1***Stakeholders, Resources and Level of Involvement*

<b>Stakeholder or Stakeholder Group</b>	<b>Type of Involvement (Planning, implementing, reflecting)</b>	<b>Possible Role(s)</b>	<b>Specific Interests</b>
Community OTPs, and community OTPs who are also ATPs (survey participants)	P	Needs assessment for course content, scheduling, mode of learning (online)	Access to PD opportunities, course content
OTPs interested in learning more about AT for computer access	P, R	Directly benefiting from course content, in hopes of increasing their clinical skills with use of AT for computer access; identify needs assessment	Successful implementation, advocacy, policy changes, access to PD opportunities
Users of AT for computer access (I.e. patients, caregivers)	P, R	consultation on course content	Successful implementation
Representatives from AOTA's Approved Provider Program	P, I, R	consultation on course content, presentation/implementation of intervention	Policy changes, patient advocacy, access to CEUs

Notes: P = planning, I= implementing, R = reflecting

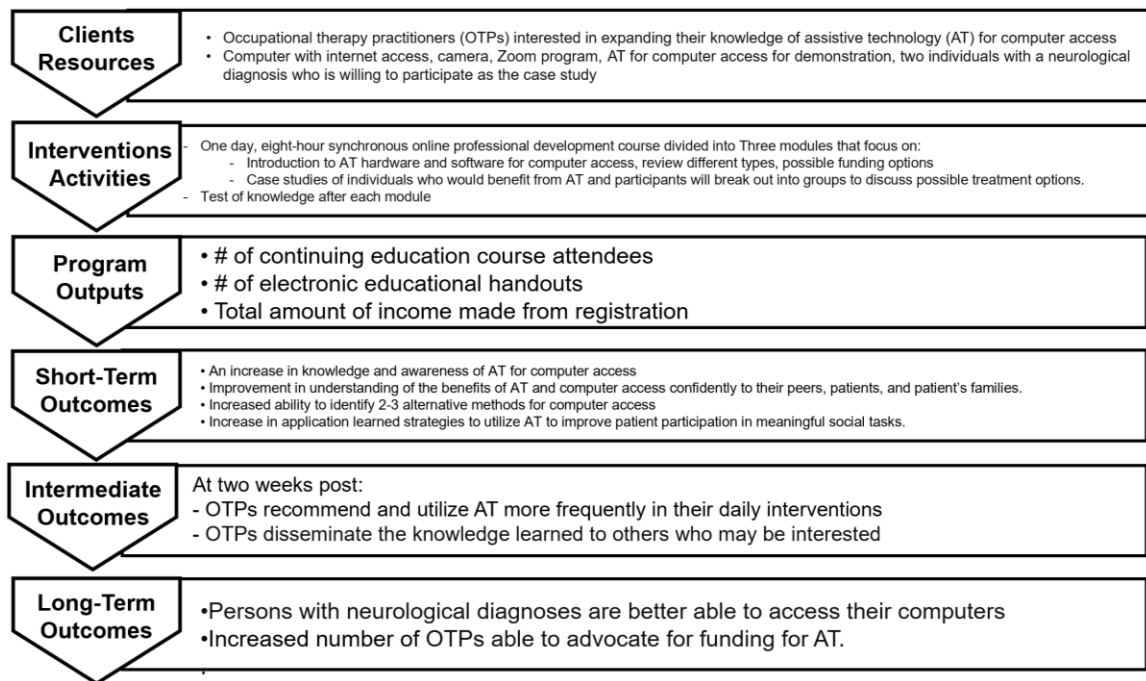
### **Simplified Logic Model**

Figure 5.2 is a simplified version of the logic model that will be provided to stakeholders to concisely present program activities, outputs, and short, intermediate, and

long-term outcomes. This version will provide stakeholders with an understanding of what is needed to achieve optimal outcomes.

**Figure 5.2**

*Simplified Logic Model for Use with Stakeholders*



**Preliminary Exploration and Confirmatory Process**

In order to promote successful implementation of the program, all of the identified stakeholders will participate in virtual meetings during the planning process, prior to and post-implementation of the program. This stakeholder meeting will take place online via Zoom to ensure that all may attend. This meeting will be at least six months prior to the initiation of the *upd(AT)e* program and then one month after implementation. In this stakeholder meeting, the program facilitators will introduce the significant role each stakeholder plays in evaluation of this program. Each stakeholder

will have the opportunity to express their concerns and provide their feedback through open discussion. The option to provide feedback anonymously will also be available to ensure honest feedback. To achieve consensus among the stakeholders, the author of this program will reiterate the common purpose that brought all of these individuals together. The program coordinators of *upd(AT)e* will review and modify the content of this program with the stakeholders to ensure the information presented is relevant and the participants are meeting their own goals by attending this course.

There will be a follow up stakeholder meeting approximately one month and seven months after implementation of the program. In these specific stakeholder meetings, the program coordinators will present the results of the program evaluation and feedback received from participants in the post-survey. This will assist in modifying the program while also discussing opportunities for improvement to resolve any concerns.

### **Program Evaluation Research Questions by Stakeholder Group**

Research questions for program evaluation are unique to each stakeholder group. Table 5.2 discusses formative and summative evaluation research questions for each stakeholder or stakeholder group. These questions will be used to help the stakeholder understand if *upd(AT)e* was successfully implemented in the way it was intended. These questions will also help to identify areas of improvement for future course offerings.

**Table 5.2***Stakeholder Program Evaluation Research Questions*

<b>Key Stakeholders</b>	<b>Formative Research Questions</b>
Course Facilitators/Author	<ul style="list-style-type: none"> <li>Does the program provide effective ways to educate participants?</li> </ul>
Community OTPs, and community OTPs who are also ATPs (survey participants)	<ul style="list-style-type: none"> <li>Would you benefit from a PD course on AT?</li> <li>What areas of AT for computer access are you most interested in?</li> </ul>
Participants of <i>upd(AT)e</i>	<ul style="list-style-type: none"> <li>Is the course content relevant and useful?</li> <li>Was the information presented clearly and easy to understand?</li> <li>Was the information presented sufficiently for participants to begin using in clinical practice?</li> </ul>
Persons with neurological diagnoses	<ul style="list-style-type: none"> <li>Does the program content accurately present what the person needs from the OTP?</li> </ul>
Representatives from the AOTA's Approved Provider Program	<ul style="list-style-type: none"> <li>Does the program accurately depict the role of AOTA in advocacy for OTP education, as well as resources to obtain AT for computer access?</li> <li>Does the course content align with ACOTE standards?</li> </ul>
<b>Key Stakeholders</b>	<b>Summative Research Questions</b>
Course Facilitators/Author	<ul style="list-style-type: none"> <li>Did the PD course improve participant's knowledge and comfort of AT for computer access?</li> <li>Did the program improve the frequency in which OTPs utilize and recommend AT for computer access in clinical practice?</li> </ul>
Participants of <i>upd(AT)e</i>	<ul style="list-style-type: none"> <li>Did participants gain knowledge from the content presented?</li> <li>Did participants report improved confidence and comfort with use of AT for computer access?</li> </ul>

Notes: ACOTE = Accreditation Council of Occupational Therapy Education;  
 PD=professional development



## Research Design

The service delivery and participant satisfaction of this program will be analyzed for this program evaluation. Therefore, the OTPs who participate in *upd(AT)e* will be the research subject of this experimental, single group study, mixed methods design. This program evaluation will collect data using both formative and summative approaches. The formative evaluation will study the course content and the online learning forum. The summative evaluation will focus on the effect of the program on the participants' level of skill, knowledge and confidence. Data for summative and formative approaches will be collected through a needs assessment, pre- and post-tests, 6 month follow up surveys, open ended feedback opportunities, and semi-structured interviews.

This research design will utilize formative approaches to gather data for program evaluation. The researcher will perform a needs assessment by sending out a survey prior to the course to identify what are the topics of interests and areas of focus. The level of skill, knowledge and confidence are the dependent variables that will be studied with the pre- and post-survey, as well as the open-ended questions for feedback. The post-survey will provide opportunities for feedback in open-ended questions to identify areas of improvement related to barriers to access the course.

Additionally, as a part of this program evaluation's summative approach, *upd(AT)e* will require participants to complete a pre- and post-survey with a Likert scale to rate their comfort level with utilizing and recommending AT for computer access. These survey results will be compared to identify any changes in level of skill, knowledge and confidence in utilizing and recommending AT for computer access.

### ***Participants***

Participants of this course and program evaluation include OTPs who are interested in learning more about AT for computer access and are enrolled in *upd(AT)e*. They will be recruited for the survey and enrollment in the PD course through online postings on AOTA CommunOT, social media, and via email blasts.

### ***Location, Setting and Time Frame***

This program will take place in a live, online forum over the course of one day, with a total of eight hours of learning. Participants for this program will be invited through advertisements on national organization's websites such as AOTA, as well as through social media and email blasts. Data will be collected online via Qualtrics prior to the start of the program, after Module Two within the program, immediately upon completion, and then six months after the program is completed. To encourage optimal participation, completion of this survey will be a prerequisite to attending *upd(AT)e*. The post-survey will be included in the conclusion of the program in order to allow for all participants to participate. This survey will also have a section dedicated to comments the participant may have regarding the organization and structure of *upd(AT)e*. Similar to the pre-test, completion of the post-test will be required in order for the participant to receive their certificate of course attendance. The course facilitators will indicate this requirement during the final module of *upd(AT)e*. Participants will also be sent reminder emails to complete. Participants will then be asked to fill out the same survey six months after attending *upd(AT)e* to identify if the level of skill, knowledge was maintained. The course facilitators will be responsible for interpreting the results of these surveys and

sharing the results with the stakeholders.

### **Outcome Measures**

The dependent variable that this program evaluation is measuring is the participant's perceived level of skill, knowledge and confidence when using AT for computer access with persons with neurological diagnoses. If the participant's skill and knowledge increases, then their confidence level will also increase, leading them to more frequently use AT for computer access in their daily practice. This increase in frequency of use will increase awareness of the AT available to improve independence with meaningful activities. As discussed above, evaluation will occur through a needs assessment survey, pre- and post-test with open ended questions for feedback, semi-structured interviews upon completion of *upd(AT)e*, and a 6-month follow up to determine if learned skills were maintained.

### ***Needs Assessment***

This author will send out an anonymous survey via Qualtrics to community OTPs and community OTPs who are also ATPs to determine their level of confidence with AT, their awareness of resources available, as well as their satisfaction with the training of AT they received in their entry-level curriculum. The results of this survey will help to influence course content in order to ensure the presented topics are relevant to the needs of the participants.

### ***Pre- and Post-Test***

The participants of *upd(AT)e* will complete a test online prior to the start of the program. This pre-test will assess the participant's knowledge and confidence with use of AT for computer access in the form of a 5-point Likert scale. The same questions will be provided to the participants upon the completion of the program in a post-test. The post-test will also have a section for open ended questions that allow the participant to provide feedback on organization and structure of the program. The researchers will compare the results of the pre- and post-test to identify significant changes to the participant's knowledge and confidence with use of AT for computer access.

### ***Semi-structured Interviews and 6-Month Follow Up Survey***

This program evaluation will use semi-structured interviews and a follow up survey sent 6 months after completion of the course to identify areas of opportunity for *upd(AT)e* to improve content and organization to improve the learner's experience. The researchers will conduct semi-structured interviews to elicit feedback and topics that will help to enhance *upd(AT)e*. The 6-month follow up survey will help to identify how *upd(AT)e* has influenced the OTPs' clinical care for persons with neurological diagnoses. This survey will also identify if the participants were able to maintain the gained skills and knowledge.

## **Data Analysis**

### ***Qualitative Data Analysis and Collection***

The surveys and pre- and post-test aspects of this program evaluation will be completed through Qualtrics. Qualtrics as it is a secure, virtual platform that allows adjustments in settings to ensure participant's anonymity. With this program, participants will be provided open-ended opportunities to respond to proposed questions. Participants of *upd(AT)e* will have the opportunity to add topics or areas of concern that were not addressed in the multiple choice and Likert scale questions. The semi-structured interviews will be audio recorded, while still maintaining the participant's anonymity. The interviews will be translated into a transcript using speech to text software. The researchers will review the text afterwards and compare the recording to the transcript to correct any technical errors. The MAXQDA program will also be used to code the qualitative data and will analyze common themes of the answers to open ended questions. The information will be stored on an external hard drive, and the identity of the participants who complete the survey will be completely anonymous.

### ***Quantitative Data Analysis and Collection***

The quantitative data analysis will also occur using the Qualtrics program. The results of the pre-and post-tests will be analyzed by paired samples t-test to determine if there were any significant changes in participant's knowledge, skills and confidence with the utilization and recommendation of AT for computer access. The information will be stored on an external hard drive, and the identity of the participants who complete the survey will be completely anonymous.

## **Anticipated Strengths and Limitations**

It is important to consider internal and external factors that may affect the outcomes of this program evaluation. Potential sources of bias, maturation, and intervention fidelity are threats to internal validity that could impact evaluation results.

### ***Potential Sources of Bias***

For the purposes of this project, the potential source of recall bias may affect evaluation outcomes. Part of the pre- survey will ask the participant to recall how their entry-level education prepared them to utilize and recommend AT for computer access in their daily interventions. A participant who has graduated more recently may have a better recollection of their studies regarding AT versus someone who has been in the field longer.

### ***Maturation***

Threats to internal validity also include maturation, as technology is developing daily. It is important to note that the information presented will be updated accordingly to match best practice and the most up to date technology available.

### ***Intervention Fidelity***

To ensure that all information is presented uniformly and how the program intended to educate the participants, the OTPs who are program presenters will be trained on the information that is required. Researchers will monitor course content to ensure the information is presented to match course objectives. This will take place outside of the stakeholder meetings as it is specific to the OTPs. However, it will be discussed during the stakeholder meetings as it is expected for all presenters to provide the same

information in a uniform manner. This will not serve as a barrier as the intervention will be implemented with one group at a time for program evaluation. Once the results are received from the post-survey, the researchers can implement changes based on the feedback and experience to improve the experience of the next group of participants.

## **Conclusion**

*Upd(AT)e* is an online PD program that focuses on improving OTPs level of skill, knowledge and confidence with using AT for computer access with persons with neurological diagnoses. The evaluation of this program will occur through formative and summative assessments such as a needs assessment, pre- and post-survey, semi-structured interviews and a 6-month follow up survey. Potential barriers, such as internet connectivity issues, lack of practitioner interest and inconvenient scheduling may interfere with the effectiveness of this PD program and program evaluation.

The findings of this program evaluation will influence future courses hosted to ensure that objectives are met, course content is relevant and up to date, and that the learners have a positive experience. The data gathered from this evaluation will be shared with key stakeholders by the researchers one month after the 6 month follow up survey is sent to through an online meeting. The purpose of this meeting is to incorporate the feedback and address areas of improvement prior to the next hosting of *upd(AT)e*.

## CHAPTER SIX – Dissemination Plan

### Introduction

*Upd(AT)e* is an eight-hour, synchronous, online course for occupational therapy practitioners (OTPs) who are interested in learning more about assistive technology (AT) for computer access. The first two modules will include presentations from experts in the field, specifically OTPs who specialize in AT for computer access. Participants of *upd(AT)e* will have the opportunity to work closely with these experts to problem solve two case studies in the third module.

### Dissemination Goals

Literature has identified that OTPs do not feel confident in utilizing AT for computer access with persons with neurological diagnoses (Dishman et al., 2021). These practitioners felt that their entry-level curriculum did not adequately prepare them to properly recommend AT. Though *upd(AT)e* aims to address this problem, a plan is needed to disseminate the availability of this program to OTPs who may be interested. This author is also conducting a program evaluation study and aims to share the results with primary and secondary audiences. This dissemination plan includes both long- and short-term goals.

The long-term goals include:

1. This course will be used to orient OTPs working with persons with neurological diagnoses to improve confidence in utilizing AT for computer access.



2. Awareness of AT for computer access resources available will increase, thus allowing for policy changes in funding.
3. *Upd(AT)e* will become a reputable and acclaimed professional development opportunity for OTPs to improve their use of AT for computer access.

The short-term goals are:

1. The author of *upd(AT)e* will establish partnerships with local hospitals.
2. *Upd(AT)e* will become an American Occupational Therapy Association (AOTA) Approved Provider for continuing education units (CEU).
3. The author and course facilitators of *upd(AT)e* will present results of pilot study at AOTA Inspire 2025 Conference.

### **Target Audiences**

The primary audience of key messages of *upd(AT)e* are OTPs who work with persons with neurological diagnoses and are interested in learning more about AT for computer access. The secondary audience are the directors of occupational therapy (OT) departments within large hospital systems.

### **Key Messages**

The key messages for the primary audience of OTPs who are interested in learning more about AT for computer access are:

1. AT for computer access can increase participation in meaningful occupations among individuals with neurological conditions.

2. This program allows participants to network and collaborate with AT experts, providing them with additional resources outside of their workplace.

The key messages for the directors of occupational therapy departments of large hospital systems include:

1. Participation in this one-day virtual professional development program yields positive results, such as an increase in perceived level of comfort in using AT for computer access.
2. After attending *upd(AT)e*, participants will be better able to advocate for the needs of their patients with neurological diagnoses to obtain funding for AT for computer access.
3. Overall awareness of the benefit of AT for computer access will increase upon completion of the program. This will allow OTPs to provide more unique, patient-centered interventions that allow persons with neurological diagnoses to use AT for computer access to engage in meaningful activities.

### **Sources and Messengers**

AT experts who are also OTPs would be most influential in disseminating the results of this program to the OTPs who are motivated to learn more about AT for computer access. They have the foundational knowledge and clinical expertise to explain the importance of the course. OTPs who have attended the course will also be messengers for the above key messages as they will provide testimonials on their personal experiences with *upd(AT)e*. Course facilitators and OTPs who attended the course would

be the spokespersons for the directors of occupational therapy departments within a large hospital system. The course facilitators are AT experts who are also OTPs, who have completed a needs assessment to support the implementation of additional training. These OTPs also created and hosted the course, so they are best able to explain to the directors of occupational therapy why it is effective. With this information, the directors of occupational therapy will have the evidence needed to support utilizing this professional development program as part of their orientation for new staff members.

### **Dissemination Activities, Tools/Techniques, Timing and Responsibilities**

Activities will be provided to assist with the dissemination of the results of *upd(AT)e*. These activities will occur as written information and electronic media. All marketing and advertisement for *upd(AT)e* will be digital. A fact sheet with program information such as schedule and contact information will be available in portable document form (PDF) and will be sent out via email blast. This email will be sent to OTPs who have expressed interest in learning more about AT through to those OTPs who have previously attended the course. This fact sheet will also be sent to the directors of occupational therapy departments at large hospital systems, who will be invited to share the information received with their staff. This author and the course facilitators will be responsible for the creation of this fact sheet, which can be found in Appendix D.

The results of this program evaluation will be submitted for a peer-review in publications such as American Journal of Occupational Therapy (AJOT), and/or Assistive Technology Outcomes & Benefits (ATOB) Journal. Publications in these well-

known journals will help to reach OTPs globally. The article will provide readers an overview *upd(AT)e*, discuss course revisions implemented after program evaluation, and clinical implications for those who are interested in participating. The manuscript will be written by this author and course facilitators as they will be most familiar with the data received from the program evaluation. The total costs for this publication will be reviewed in Table 6.1.

Electronic media will also be used to disseminate *upd(AT)e*'s program results. *Upd(AT)e* will be marketed on DIYAbility.org and will be the main site that OTPs visit to register for the course. Potential participants and directors of occupational therapy departments within large hospital systems will also find the program fact sheet and links to the peer reviewed articles that discuss *upd(AT)e*'s program evaluation. Other forms of electronic media include postings on social media such as Facebook and LinkedIn, as well as public forums on national organization websites such as Rehabilitation Engineering and Assistive Technology Society of North America (RESNA)'s listserv and AOTA's CommunOT. This author will be responsible for working with the creator of DIYAbility.org and creating posts on social media and public forums.

Person-to-person contact will also occur when disseminating the program evaluation results. This author and the course facilitators will present these findings at organizational conferences such as AOTA Inspire. This presentation will review the benefits of AT for computer access, describe background information on *upd(AT)e* and will discuss how the results of the program evaluation was implemented. This author also will network with potential program participants as well as directors of occupational

therapy departments at these conferences. Aside from conference interactions, this author and course facilitators will meet with the directors of OT departments to discuss how participation in this professional development opportunity will increase OTPs level of confidence with the utilization and recommendations of AT for computer access.

### **Budget**

Though the dissemination activities of *upd(AT)e* will be completely digital, there are several costs included such as time required to create the fact sheet, transportation costs, conference costs and publication costs. Table 6.1 provides an overview of the costs required for the dissemination activities.

**Table 6.1**

*Budget for Dissemination Activities (Two-year plan)*

<b>Activity</b>	<b>Cost</b>
Compensation for time to create fact sheet, research article by this author and course facilitators of the <i>upd(AT)e</i>	\$3,000 ((\$50/hour, estimated 10 hours for the author and two course facilitators, \$1,500 per year)
Transportation costs for person to person contact at conferences	\$3,000 (estimated shared expense among the author and two course facilitators)
Conference Fees	\$1,110 (\$550/year for two years)
Copyright costs for article publications	Free to submit \$110 (\$55/year for a subscription for two years)
<b>Total</b>	<b>\$7,220</b>

## Evaluation

The evaluation of the success of dissemination activities will be evaluated in several ways. The first form of evaluation is to identify if there is an increase in registration of participants in courses following the activities. If there is an increase in registration, this will indicate that the dissemination activities reached the intended audience and provided the information needed. Another form of evaluation is to identify the number of times the *upd(AT)e* fact sheet is downloaded on DIYAbility.org. The number of downloads will provide this author with information indicating the level of interest of OTPs interested in learning more about *upd(AT)e* and possibly attending the course.

## Conclusion

The dissemination activities of *upd(AT)e*'s evaluation are vital to the success of this online professional development program. The benefits of *upd(AT)e* will be available through conference presentations, fact sheets and article publications. These activities provide the results of pre- and post-surveys, information of the course content, and clinical implications of *upd(AT)e*. These dissemination activities will demonstrate the positive impact that participation in the course has on OTPs' level of confidence in utilizing and recommending AT for computer access.

## CHAPTER SEVEN – Funding Plan

### Introduction

*Upd(AT)e* is an online professional development (PD) program for occupational therapy practitioners (OTPs) who are interested in learning more about assistive technology (AT) for computer access. Research has shown that OTPs do not feel that their entry-level curriculum prepared them to use AT as a clinical intervention (Dishman et al., 2021). Additionally, PD courses are not often offered or are difficult for OTPs to attend due to scheduling constraints and geographical barriers (Hughes, 2020; Johnson Coffelt & Gabriel, 2017). This program intends to address these problems and overcome the identified challenges to improve overall awareness of AT for computer access. This increase in awareness will allow for OTPs to meet the needs of persons more effectively with neurological diagnoses.

### Available Local Resources

Funding is required to assist in the success of this program. Local resources and financial support were explored to assist with covering the overhead costs of *upd(AT)e* for the first two years. Volunteers are needed to set-up, complete administrative duties such as taking attendance, monitoring time spent within modules to remain on or close to schedule, monitoring the online chat for participant comments or questions, and communicating with the information technology (IT) department to help troubleshoot any technical issues. These volunteers will be recruited through the local colleges as no specific expertise is needed. The author will volunteer her personal time to plan and

coordinate the program. Two additional course facilitators, who are also OTPs, will present clinical information in Modules One and Two alongside this author. This course facilitators will also assist this author in coordinating, implementing and evaluating the effectiveness of *upd(AT)e*. The course facilitators will be compensated for their time dedicated to the planning of the program.

Marketing will be completed online through networking, posts on public forms and listservs, e-mail, and social media. All marketing material will be digital, and no printing costs will be incurred. *Upd(AT)e* will be advertised to OTPs on DIYAbility.org. This website is owned by a colleague of this author and will incur no additional costs for the first two years. The fact sheet, program flyerer and presentation formats will be downloaded from free online resources such as Canva and stock photos. As this program is solely online, this author and course facilitators will have the option to present in the location that is most convenient for them, incurring little to no travel expenses.

### **Needed Resources: Budget**

Some expenses are required to ensure the success of *upd(AT)e*. The author and course facilitators for this online course will be stationed in a rented space through WeWorks. The author and other course facilitators will use their own personal computers and internet service to coordinate the *upd(AT)e*, however, a dedicated Windows notebook computer and a MacBook for the program is required to host the virtual classroom and to demonstrate accessibility capabilities.



To provide participants with a clear image during the demonstration of AT, an overhead webcam connected by universal serial bus (USB) is required. Funding to purchase the showcased AT is also needed to ensure the success of this program. Table 7.1 includes a list of AT that will be demonstrated to participants and the price of each item. The author will be responsible for obtaining, transporting, and storing all AT used for the program.

**Table 7.1**

*AT for Demonstration in Module One*

<b>Item</b>	<b>Price</b>
GlassOuse PRO (Head Mouse)	\$799.00
Enlarged Keyboard With keyguard	\$26.99 - \$149.95
Mini Keyboard	\$29.99
Eye Gaze	TD Pilot with Eyegaze \$8,665 PC Eye: \$1,249
Ergonomic Mouse	\$23.99
Ergonomic Keyboard	\$49.99
External Trackpad	\$34.99
Keyboard and Touchpad	\$26.99
n-Abler Joystick	\$441.99
Tapio Switch Interface	\$119.95
<b>Total:</b>	<b>\$11,617.83</b>

Table 7.2 describes a list and monetary cost of inventory needed for the first four sessions of the program in the first two years. This author completed an independent

market search of the continuing education courses on Assistive Technology Industry of America (ATIA), Rehabilitation Engineering Society of North America (RESNA), and American Occupational Therapy Association (AOTA), and found an average of \$325 cost for registration of an eight-hour online course. The registration fees will be processed through PayPal, which will charge a fee of 3.49%, plus \$0.49 per transaction.

This program will be hosted on the Zoom online video platform. While there is a free subscription available, the Zoom Webinar subscription features such as high quality videos, active engagement with participants and post event reporting (Zoom Video Communications, 2024). Though this is not yet an AOTA Approved Provider program, this author intends to apply for consideration. This application and acceptance has annual costs. As an AOTA Approved Provider, this program will be better able to reach more clinicians who may be interested in learning more about AT for computer access. For the first year, no Canva subscription will be needed to create course content and presentations as the “free” content will be used. For year two, to improve presentation formats and customization options, a Canva Teams subscription is required. According to the AOTA 2023 Workforce and Compensation Survey Premium Report, the average hourly wage for OTPs is \$47. With this data in mind, the author and other course facilitators will receive an hourly wage of \$50/hour. This author will begin receiving income from *upd(AT)e* starting Session Two of Year One, as their time will be volunteered for Session One. After Session One of Year One, the author and course facilitators will log the hours dedicated to content development for Module One. This author will primarily be responsible for responding to emails from participants,

management of volunteers and coordination of meeting with stakeholders. The course facilitators will be compensated for their assistance with data interpretation and implementation of program evaluation results.

**Table 7.2**

*Upd(AT)e Budget*

<b>Resources</b>	<b>Cost: Session One of Year One</b>	<b>Cost: Session Two of Year One</b>	<b>Cost: Session One of Year Two</b>	<b>Cost: Session Two of Year Two</b>
Zoom Pro subscription (yearly)	\$690	\$0	\$690	\$0
Qualtrics Membership	\$1,440 (\$120/month)	\$0	\$1,440 (\$120/month)	\$0
AOTA Approved Provider Fee	Initial Fee: \$75 Recognition by AOTA as an Approved Provider: \$625 Tier 1 Annual Fee: \$200	\$0	Tier 1: Annual Fee (Year 2– 7): \$400	\$0
Dissemination of Findings (Publication Costs, Conference Fees)	\$3,610	\$0	\$3,610	\$0
Canva Teams Subscription	\$0	\$0	\$300 (yearly fee)	\$0
Personnel Salary (Course Facilitators)	\$600 (\$50/hour for two course facilitators, not including author)	\$900 (\$50/hour for three course facilitators, including author) Estimated additional \$900 for course	\$900 (\$50/hour for three course facilitators, including author) Estimated additional \$900 for	\$900 (\$50/hour for three course facilitators, including author) Estimated additional \$900 for

		preparation and updates	course preparation and updates	course preparation and updates
Facility Rental Fee – WeWork	\$400 (\$8/seat, estimated 50 virtual participants)	\$400 (\$8/seat, estimated 50 virtual participants)	\$400 (\$8/seat, estimated 50 virtual participants)	\$400 (\$8/seat, estimated 50 virtual participants)
PayPal	\$591.50 (\$11.83 x estimated 50 participants)	\$591.50 (\$11.83 x estimated 50 participants)	\$591.50 (\$11.83 x estimated 50 participants)	\$591.50 (\$11.83 x estimated 50 participants)
Purchase of AT (see Table 7.1)	\$11,617.83	\$0	\$0	\$0
iPad Pro	\$1,299	\$0	\$0	\$0
Windows Laptop	\$699	\$0	\$0	\$0
MacBook	\$1,099	\$0		
External overhead webcam	\$89.99			
Total Expenses	\$21,992	\$2,792	\$9,787	\$2,792

### Potential Funding Sources

Table 7.3 describes possible funding resources for the creation of the program and indicates whether the capital will be used for utilization and/or implementation of *upd(AT)e*. Though participants will pay a registration fee, this will not be enough to cover all costs to ensure an efficient program. The income awarded by these grants and foundations will assist to cover course facilitator wages, and costs for subscriptions and equipment. This funding may also provide support to participants who need financial assistance to pay registration fees and attend the program.

**Table 7.3***Funding Sources*

<b>Funding Type</b>	<b>Funding Source</b>	<b>Description</b>	<b>Implementation or Utilization</b>
Personal Capital	Personal Fund	The author of <i>upd(AT)e</i> will use funds from personal accounts to develop the program in the first year	Implementation and Utilization
Gained Capital	Income from registration fees	The income incurred from the registration fees will be used to compensate guest speakers, course facilitators and cover subscription costs.	Implementation and Utilization
Grant	Nedra Gillette Endowed Research Fellowship	<p>“The Nedra Gillette Endowed Research Fellowship award is in support of a postdoctoral researcher’s foundational occupational therapy study into the human condition.” (American Occupational Therapy Foundation, 2024)</p> <p>This one year award of \$5,000 will assist the author in continuing to research the effectiveness of <i>upd(AT)e</i> in improving OTPs’ level of comfort in using AT for computer access.</p>	Implementation
Foundation/Grant	Rehabilitation Engineering Society of North America (RESNA)	This national society grants \$1,000–\$2,000 for initiatives that aim to train or disseminate information of AT using their online course platform. This organization also grants \$500–\$2,000 to professionals with finding topic experts for contractual work. (RESNA, 2018)	Implementation

**Conclusion**

*Upd(AT)e* aims to bridge the gap in knowledge of AT for computer access experienced by OTPs. This online professional development program overcomes the barriers of location, inconvenient scheduling, and lack of availability of continuing education courses. Participants of this program will have the opportunity to learn from AT experts and will put their gained knowledge into practice. The funding plan described in this chapter identifies local resources, proposed budget and potential funding resources that will aid in the continued success of *upd(AT)e*.

## CHAPTER EIGHT – Conclusion

Studies have shown that occupational therapy practitioners (OTPs) feel that their entry-level curriculum did not adequately prepare them to utilize assistive technology (AT) in their daily interventions (Arthanat et al., 2017; Dishman et al., 2021). In addition, professional development (PD) opportunities to learn more about AT require time to travel, time away from work and additional financial responsibilities, which serve as barriers to an OTPs ability to attend (Johnson Coffelt & Gabriel, 2017). This lack of confidence and limitations to access of professional development opportunities lead to decreased utilization and recommendation of AT for computer access in clinical practice. If OTPs are not recommending AT for computer access, then persons with neurological diagnoses will not be able to effectively participate in meaningful activities and are at risk for experiencing occupational injustice.

The review of current literature as well as a needs assessment conducted by this author influenced the creation of *upd(AT)e*. *Upd(AT)e* is a synchronous, online professional development program for OTPs who are interested in learning more about AT for computer access to support occupational engagement among those with neurological diagnoses. This chapter is intended to summarize the key points of each section of this doctoral project to highlight the importance of this professional development program.

The course content of *upd(AT)e* is divided into three modules and presented by OTPs who are experts in AT. The first module focuses on hardware for alternative access, such as adaptive keyboards and mice. The second module reviews built-in

accessibility software on common computer operating systems. In the third module, participants are presented with two case studies in which they collaborate with one another, as well as course facilitators, to help the patient achieve their goal through use of AT for computer access. The creation of this course content was influenced by Social Cognitive Theory (SCT) and the Human, Activity, and Assistive Technology (HAAT) model. These models combined consider how motivation, learning, and environment influence a person's success in achieving a specific goal.

The program evaluation of *upd(AT)e* focuses on identifying course content and delivery, supporting the effectiveness of online learning and improving participant's knowledge, skill and confidence with use of AT for computer access. This assessment is completed through a needs assessment, pre- and post-testing, semi-structured interviews, and a 6-month follow up survey. The results identified by this program evaluation will contribute to current literature to support the importance of AT for computer access and the positive results of online learning. The results will also be presented at conferences to OTPs interested in learning more about AT for computer access and to directors of occupational therapy departments who frequently provide treatment for the neurological population. *Upd(AT)e* aims to improve participants' overall confidence with use of AT for computer access and along with this increased confidence, clinician awareness will improve, thus allowing for potential policy changes in funding and for OTPs to provide unique and patient-centered interventions.



## APPENDIX A – Program Flyer



**Give occupational therapy practitioners the opportunity to learn about (A)ssistive  
(T)echnology and the evidence behind it all!**

### What is AT?

According to the Assistive Technology Act of 2004, assistive technology (AT) is 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” (Individuals with Disabilities Education Act (IDEA), 2017). As occupational therapy practitioners (OTPs), we play a vital role in recommending AT to our patients who would benefit, especially those with upper extremity impairments. Unfortunately, studies have shown that a significant number of clinicians, including OTPs, do not feel that their entry-level curriculum prepared them to comfortably incorporate AT into their interventions (Arthanat et. al, 2017). This lack of confidence affects the clinician’s ability to properly and effectively address their patient’s needs, thus inadvertently affecting their organization, levels of stress, and ability to promote and advocate for OTPs role in recommending AT.

### What can AT be used for?

AT can be used for a variety of activities, however, for the purposes of this editorial, we are going to focus on spreading awareness about AT that improves independence with computer access. According to a study done by Baldassin et. al (2018), the use of AT for computer access has had a significant positive impact on persons with spinal cord injury and their quality of life. This study found that AT for computer access helped individuals return to work, school and socialization activities. However, according to Howard et. al (2022), AT user reported the healthcare professionals were not up to date on products available and knowledge, and lacked training on how to properly use and access devices. This can greatly impact patient carryover as well as the likelihood of abandonment of the AT. Gitlow and Sanford (2003) found that OTPs reported they only have a basic understanding of AT and had a significant need for more information on how to use AT.

### Where can I learn more about AT?

Unfortunately, OTPs of all levels, who do not have a specific interest in AT are unaware of the resources available to them and are interested in learning more about AT (van Niekerk, 2018). upd(AT)e is a continuing education course for OTPs of all experience levels that aims to improve clinician’s awareness of AT for computer access. Van Niekerk et. al (2018) concluded that a clinician’s perception of their skill influences the type of AT they recommend. If the OTP is aware of what resources are available to them, then they will be able to address their patient’s needs and therapeutic goals more effectively.

### References





# upd(AT)e

## What are the objectives of upd(AT)e?

By the end of this continuing education course, participants will be able to:

- Explain 1-2 benefits of AT and computer access confidently to their peers, patients, and patient's families.
- Identify 2-3 alternative methods for computer access for persons with upper extremity impairments.
- Independently apply learned strategies to utilize AT to improve patient participation in meaningful social tasks.

Participants will also have access to the course leaders and guest speakers' contact information. This will allow for participants to ask additional questions and the opportunity to form professional relationships. Participants of this continuing education course will also be given a follow-up survey regarding the course content to suggest areas of improvement for following courses.

Potential guest speakers include representatives from large tech companies such as Apple and Microsoft. These representatives may have professional relationships with the Assistive Technology Industry Association (ATIA), which is another great resource for clinicians interested in AT.

## Frequently Asked Questions (FAQ)

**I can't make it in person. Is there a virtual option?** Yes! This course is 100 % virtual will be available via Zoom. Once you sign up, you will receive an email with the Zoom link and further instructions.

**I'm not familiar with assistive technology (AT), where can I learn more?** Right here! After attending this course, participants will have a more expansive understanding of AT and will feel more confident and comfortable in recommending AT to their patients. Not only will this increase in confidence help the clinicians, but it will also help patients engage in meaningful activities, such as emailing and online shopping (and more!) independently.

## What are the professional requirements for this course?

This course is intended for OTPs of all levels. Previous experience with AT is not required. (Only the motivation to learn more!) This course intends to reach all clinicians who are interested in AT to improve the comfort and confidence of OTPs in recommending and including AT in their interventions with persons with upper extremity impairments to access their computers. Studies have shown that clinician comfort and confidence affect what AT they recommend (van Niekerk, 2018). If more clinicians are comfortable and confident with recommending AT, they will better serve the needs of their patients and will spread awareness to stakeholders from all levels.

## Where can I get more information?

Please feel free to e-mail the course coordinator with any questions at [updATe.otcourse@gmail.com](mailto:updATe.otcourse@gmail.com). We look forward to hearing from you!

**APPENDIX B— Example of Test of Knowledge****TEST YOUR KNOWLEDGE!**

Select the correct answer.

**1. Which of the following are examples of assistive technology hardware? Choose all that apply.**

- a. Eye gaze
- b. Head Mouse
- c. Joystick Mouse
- d. Mini keyboard
- e. Built-in magnifier

**2. Which of the following are examples of assistive technology software? Choose all that apply.**

- a. Dwell click
- b. Built in magnifier
- c. Joystick mouse
- d. Speech to text
- e. Closed captioning

**3. Which neurological diagnosis would benefit from the use of assistive technology?**

- a. Cerebral vascular accident (CVA)
- b. Spinal cord injury (SCI)
- c. Traumatic Brain Injury (TBI)
- d. Multiple Sclerosis (MS)
- e. All of the above

**4. TRUE or FALSE: All types of assistive technology are covered by insurance.**

- a. True
- b. False

## **APPENDIX C – Executive Summary**

### **Introduction**

Assistive technology (AT) for computer access can help a person with a neurological diagnosis to engage in meaningful tasks more independently. The Accreditation Council for Occupational Therapy Education (ACOTE) Standard B.4.11 requires accredited Master of Science (MS) and Occupational Therapy Doctorate (OTD) programs to teach students to, “assess the need for and demonstrate the ability to design, fabricate, apply, fit, and train in assistive technologies and devices (e.g., electronic aids to daily living, seating and positioning systems) used to enhance occupational performance and foster participation and well-being” (ACOTE, 2018, p. 30). Despite this Standard, studies have shown that occupational therapy practitioners (OTPs) of all levels of experience feel that they would benefit from continued professional development (PD) opportunities for AT for computer access (Dishman et al., 2021). Though there is this need for PD opportunities, OTPs are unable to attend due to lack of availability, geographical barriers, financial responsibilities and inconvenient scheduling (Arthanat et al., 2017; Dishman et al., 2021; Gitlow & Sanford, 2003; Johnson Coffelt & Gabriel, 2017). *Upd(AT)e* is an online PD programs created to overcome these barriers through a one-day, eight-hour synchronous learning opportunity for OTPs who are interested in learning more about AT for computer access.

## **Key Findings**

According to the World Federation of Occupational Therapists (WFOT), OTPs offer a distinct perspective about AT as they consider an individual's abilities, therapeutic goals and environment to fully understand what is needed to best achieve positive outcomes (WFOT, 2012). However, evidence suggests that OTPs feel their entry level curriculum did not adequately prepare them to utilize AT in their daily interventions (Dishman et al., 2021). Even though these Standards are set, this study also indicates many educators are unfamiliar or uncomfortable with teaching about AT in the classroom (Dishman et al., 2021). This limited exposure, as well as lack of available post-educational opportunities for AT, and an overall decreased awareness of availability of AT resources contributes to the gap in OTPs knowledge of AT for computer access (Arthanat et al., 2017; Dishman et al., 2021; Gitlow & Sanford, 2003).

This author created an exploratory needs assessment survey for OTPs to further understand their experiences with the use of AT for computer access. This survey identified that the lack of post-educational training is impacting the frequency in which AT is utilized and recommended by OTPs. Of the OTPs who participated in this survey, 77% of felt that they would benefit from further education on AT for computer access.

## **Program Overview**

Studies suggest that there is a gap in knowledge of AT for computer access in OTPs of all levels of experience (Dishman et al. 2021). *Upd(AT)e* was created to address this need and was influenced by elements of the Social Cognitive Theory (SCT), specifically self-efficacy, observational learning, and reciprocal determinism. These

elements explore the effects of motivation, environment and learning reinforcements on OTPs' level of confidence and comfort with utilizing AT for computer access. Like SCT, the human, activity, and assistive technology (HAAT) model also influenced the creation of course content to help participants understand how to select the most appropriate AT for their patients. This model focuses on the importance of the interaction between the human, activity, AT, and environment when using AT to complete their IADLs (Cook & Polgar, 2015).

This online program will be divided into three modules. In the first two modules, course facilitators will introduce and demonstrate proper use of the hardware such as adaptive keyboards and mice, as well as software built-in accessibility options that allow for a person with a neurological diagnosis access their person device more independently. Participants will be able to apply learned knowledge in the third module, where they will be presented with case studies to address alongside course facilitators who are also OTPs and experts in the field of AT.

*Upd(AT)e* aims to improve OTPs perceived levels of comfort with utilizing and recommending AT for computer access. If OTPs feel more comfortable in utilizing AT for computer access, they will be better able to meet the needs of their patients with neurological diagnoses. This improvement in clinical practice will increase awareness and improve patient outcomes when working towards therapeutic goals.

**Recommendations**

Recommendations for this program propose improvements in awareness and comfort with use. The primary audience of these recommendations are OTPs who are interested in learning more about AT for computer access. The course facilitators, who are OTPs as well as experts of AT will educate this audience on the aim of *upd(AT)e* to educate OTPs on AT for computer access for persons with neurological diagnoses. With this improvement in knowledge, OTPs will better be able to serve the needs of their patients by utilizing AT in their daily interventions to help increase participation in meaningful occupations. This program will also provide OTPs the opportunity to collaborate and network with AT experts, who may serve as an additional resource outside of the workplace.

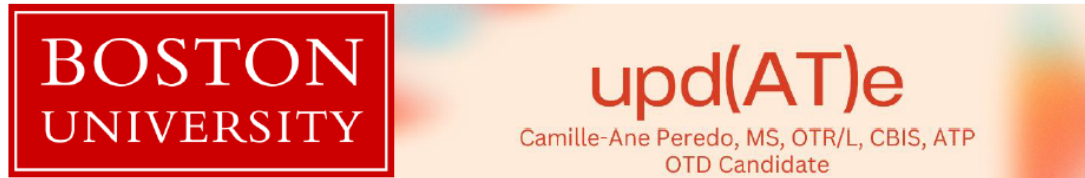
The secondary audience for this program recommendation are directors of occupational therapy departments in large hospital systems. The course facilitators of *upd(AT)e* will educate the directors on the benefit of the program, specifically the increase in OTPs' perceived level of comfort in using AT for computer access and the improved ability to provide patient-centered interventions unique to their therapeutic goals. The inclusion of *upd(AT)e* in orientation processes for newly hired staff will assist directors in ensuring their staff feel comfortable using AT for computer access. As OTPs confidence with use of AT for computer access improves, they will also be better able to advocate for the needs of their patients to obtain funding.

**Conclusion**

There is a need for an easily accessible PD program for OTPs who are motivated to learn more about AT for computer access. *Upd(AT)e* addresses the gap in knowledge and other barriers identified by providing an online, synchronous program that introduces and reviews AT for computer access. With this knowledge, OTPs are better equipped to improve the ability of a person with a neurological diagnosis to access their personal devices to engage in meaningful activities.

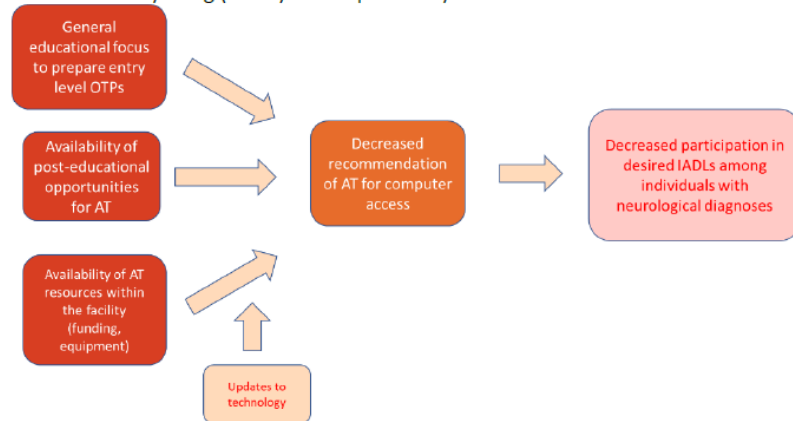


## APPENDIX D – Fact Sheet



### Main Issue

There is a gap in knowledge of the benefits of the use of assistive technology (AT) for computer access in the occupational therapy (OT) community (Arthanat et al., 2017, Dishman et al., 2021). This leads to decreased recommendation of AT for computer access. If occupational therapy practitioners (OTPs) are not frequently utilizing this intervention, then persons with neurological diagnoses will not be able to participate in instrumental activities of daily living (IADLs) as independently.

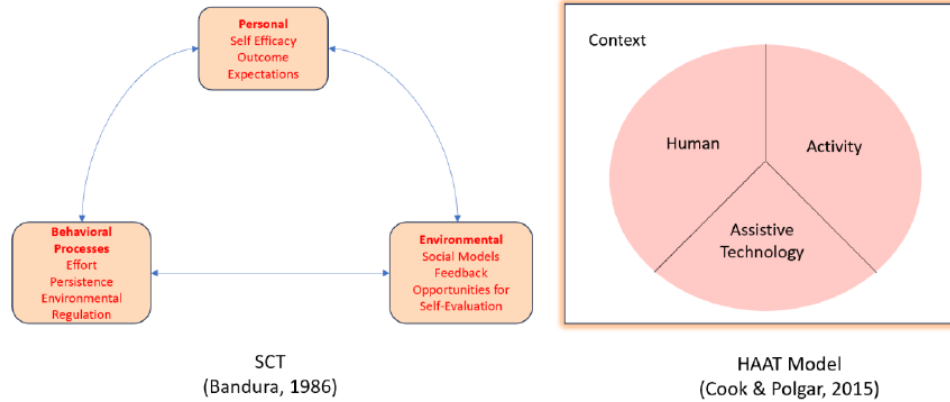


### The Solution

<b>What is it?</b>	<i>Upd(AT)e</i> is a professional development program for OTPs who are interested in learning more about AT for computer access. This program was created to address the gap in knowledge and to help clinicians overcome any barriers to accessing professional development opportunities.
<b>Who would benefit?</b>	<ul style="list-style-type: none"> <li>OTPs who are interested in learning more about AT for computer access</li> <li>All levels of experience are welcome!</li> </ul>
<b>Course Content</b>	<p>Over the course of eight hours, participants of <i>upd(AT)e</i> will have the opportunity to:</p> <ul style="list-style-type: none"> <li>Review adaptive hardware</li> <li>Review software and built in accessibility options on mainstream operating systems</li> <li>Mentorship experiences with AT experts</li> </ul>

## Theory

*Upd(AT)e* was influenced by Social Cognitive Theory (SCT) and the human, activity, and assistive technology (HAAT) model. These models take into consideration how motivation, learning, and environment influence a person's success in achieving a specific goal.



## Program Objectives

- Participants will be able to explain at least three benefits of AT and computer access confidently to their colleagues, patients, and patient's families.
- Participants will identify two hardware and two software alternative methods for computer access for persons with neurological diagnoses.

## Funding and Dissemination

This professional development program will be funded by participants' registration fees and awarded grants. Program evaluation will occur throughout each session to identify strengths and areas of improvement for subsequent sessions. The results of this program evaluation will be presented to OTPs who are interested in participating in *upd(AT)e* and directors of occupational therapy departments in large hospital systems. The overarching goal of this dissemination of information is to improve overall awareness of the benefit of this program for OTPs and patients with neurological diagnoses.

## Clinical Implications

Support for OTPs <i>upd(AT)e</i> will..	Significance for Occupational Therapy
Build OTPs confidence in utilizing AT for computer access with persons with neurological diagnoses	OTPs will use AT as a primary intervention for persons with neurological diagnoses
Improve overall awareness of AT for computer access for OTPs and persons with neurological diagnoses.	The role of occupational therapy and OTPs will be more defined with the use of AT.
overcome identified barriers to attending professional development opportunities for AT for computer access.	<i>Upd(AT)e</i> will support advocacy efforts for policy changes in funding for AT.

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**CURRICULUM VITAE**

