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Michele L. Tilstra
Walsh University

Michelle L. Webb
Rocky Mountain University of Health Professions

Sandra E. Groger
Rocky Mountain University of Health Professions

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Abstract

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Keywords

Telehealth, technology education, older adult occupational therapy, occupational therapy curriculum

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Instructing Students How to Use Evidence-based Technology Interventions with Older Adults

Michele L. Tilstra, OTD, OTR/L, CHT¹

Michelle L. Webb, OTD, OTR/L, RAC-CT, CAPS²

Sandra E. Groger, OTD, OTR/L²

Walsh University¹

Rocky Mountain University of Health Professions²

United States

ABSTRACT

Current evidence supports the use of technology with older adults and the Accreditation Council for Occupational Therapy Education standards for entry-level occupational therapy programs mandate instruction on the use of technology to support occupational performance. The literature does not clearly define specific strategies to teach entry-level occupational therapy students how to implement technology interventions with older adults. The purpose of this paper is to provide OT educators with recommendations for teaching entry-level students to use evidence-based technology with older adults. The authors reviewed current literature. The recent evidence helped the authors define practical curriculum recommendations for instructing entry-level occupational therapy students to integrate technology into older adults' interventions. Recommendations include use of telehealth visits, teleconferencing, iPad applications, smart phone applications, texting, emails, and video applications. With technology continually changing, occupational therapy instructors must increase their awareness of new applications and computer programs that occupational therapists can utilize in older adult interventions to maximize knowledge translation to their students.

INTRODUCTION

Technology is transforming the way occupational therapists (OTs) deliver healthcare to their clients, and entry-level OT students must be competent in using technology across the lifespan. Rapidly advancing technology has created a significant technology literacy lag in older adults, and OTs should address this lag by providing educational

opportunities for older adults to use technology (Arthanat, Vroman, & Lysack, 2016). Entry-level OT faculty must prioritize technology education in instructional content related to older adults to help prepare students to implement technology into clinical practice (Arthanat et al., 2016). Recent evidence reports the benefits of using technology with the older adult population (Arthanat et al., 2016; Choi, 2011; Vroman, Arthanat, & Lysack, 2015; Wallace, Graham, & Saraceno, 2013), but there is limited guidance on how to integrate technological interventions for older adults into OT curriculum. The purpose of this paper is to provide OT educators with recommendations for teaching entry-level students to use evidence-based technology with older adults.

BACKGROUND

Technology used in older adult OT interventions may include telehealth visits, teleconferencing, e-readers, iPad applications, smart phone applications, texting, emails, computer programs, and video applications. This use of technology does not fall under the definition of assistive technology in which both the technology device and service are focused on improving functional capabilities of the client (Goodrich & Garza, 2015). According to Gitlow (2014), technologies are becoming increasingly important parts of daily routines and occupations of our clients. It is therefore important for OT practitioners who work with clients across the lifespan to utilize their understanding of technology to help older adults participate in therapy interventions (Gitlow, 2014). In the 2017 Eleanor Clarke Slagle Lecture, Roger Smith described technology as a fundamental and essential component of occupation. He urged OTs to accept the mandate of integrating technology into occupation-based interventions as it has the ability to improve quality of life for many clients (Smith, 2017). In addition, the American Occupational Therapy Association (AOTA; 2010c) included in their definition of telerehabilitation the use of health and wellness technological applications, which therapists can utilize in monitoring clients' adherence to therapeutic home programs and track progress towards outcomes.

By acquiring knowledge of current technology applications, OTs can use their skills in analyzing clients' abilities, context, and preferred occupations to best match clients' needs to specific technology (Smith, 2017). Through using current technology in skilled interventions with clients, OTs help meet society's needs in promoting healthy occupations and quality of life (AOTA, 2017). The use of technology in the education of older adults is one way OTs can be culturally responsive and provide customized services for clients to facilitate more accessible, collaborative, and effective care (AOTA, 2017). However, OT instructors need to diligently increase their knowledge of available technology for use in older adult interventions, so they can teach students to utilize these technologies as entry-level OTs.

Technology and Older Adults

According to Zickuhr and Madden (2012), 53% of Americans ages 65 and older are using the internet or email, which is a significant gain in technology use in this population. Even though older adults (age 65+) are still less likely than younger adults to use technology, 70% of those who use technology typically access the internet daily (Choi, 2011; Zickuhr & Madden, 2012). In addition, a significant increase (34%) of the

older adults using technology access social networking sites to stay in touch with friends and family while the majority (86%) communicate using email (Zickuhr & Madden, 2012). Vroman et al. (2015) noted older adults with the most limited use of technology were isolated, lacked a social network, and had limited community independence. Technology has the potential to improve older adults' quality of life and ability to age in place through providing extensive resources for addressing occupational demands and increasing access to healthcare (Chaffin & Harlow, 2005; Vroman et al., 2015). However, Heart and Kalderon (2013) reported the adoption of technology for health information is still very limited in the older population. While technology use in older adults is on the rise, researchers have identified several barriers to utilizing technology with older adults including lack of confidence with technology, the perception that it will be difficult to use, decreased attention span, decreased memory capabilities, and changes in vision (Gitlow, 2014; Vroman et al., 2015; Wallace et al., 2013). Older adults want to maintain control over their autonomy, but they are challenged by age-related physical and cognitive changes (Chaffin & Harlow, 2005). Occupational therapists who choose to utilize technology with older adults should consider characteristics, attitudes, and beliefs of the clients to more likely accommodate their needs and interests (Wallace et al., 2013). Therapists must help older adult clients build knowledge and skills in using technology while also addressing client concerns and identifying how using technology can be personally relevant (Vroman et al., 2015). Heart and Kalderon (2011) emphasized the importance of keeping technology interventions simple and demonstrating the benefits to older adults while respecting personal and cultural characteristics.

Teaching Students to Use Technology in Clinical Practice

OT educators who have integrated technology into their instructional delivery recognize the current generation of students are competent users of technology and the internet (Gee, Salazar, Porter, Clark, & Peterson, 2017; Hills, Ryan, Smith, & Warren-Forward, 2012). However, some educators continue to report barriers to teaching students to utilize technology in clinical practice; these include the instructor's lack of planning time, knowledge, and access to current technology (Gee et al., 2017). A gap in the literature exists regarding specific OT instructional content on the implementation of technology in older adult client education. This lack of instructional content makes it difficult for new OT faculty to integrate technology into courses, while simultaneously writing syllabi, modules, lectures, assignments, rubrics, and tests. Even experienced professors may lack the technological competency necessary to teach students to use technology in clinical practice (Gee et al., 2017). While it may not be feasible to address all concerns of instructors in the use of technology in the classroom, a concise, practical guide outlining specific ideas to integrate technology for older adults into an established OT curriculum may result in students who are more competent in implementing these strategies with their older adult clients.

METHODS

An initial search of the CINAHL, PubMed, and Ebsco databases used terms chosen to ensure a relevant and focused review of articles related to technology and education. The terms included technology, patient education, occupational therapy, entry level

education, patient education, and client education yielded 19,368 results. Limits included articles within the last ten years, English language, aged population, and the use of specific MESH terms reduced the number of scholarly articles for review to 342. These abstracts were screened to determine if they provided evidence related to either the use of technology in educating older adults or the instruction of occupational therapy students to use technology. This screening further narrowed the articles for full text review to 92. During the full text review, articles were excluded that had low levels of evidence, did not use technology with client education, or did not address college level instructional techniques for use of technology. Sixteen research articles were selected to inform this manuscript along with several other references to support key points. Additionally, five of the articles used for this manuscript were analyzed using an evidence table that characterized the methodology, results and limitations of each article. The articles used to inform this manuscript are congruent with the overall purpose of the paper, which is to provide OT instructors with ideas for teaching entry-level practitioners to utilize evidence-based intervention strategies using technology for older adult interventions.

STRATEGIES FOR TEACHING STUDENTS TO USE EVIDENCE-BASED INTERVENTIONS USING TECHNOLOGY WITH OLDER ADULTS

Instruct Students How to Assess Clients' Priorities and Desire to Use Technology

Therapists should assess older adults' priorities for using technology along with the wants and needs of the client to help individualize technological educational programs (Arthanat et al., 2016; Edgar et al., 2017). To identify client priorities, an excellent tool to use is the Canadian Occupational Performance Measure (COPM). This client-centered assessment tool allows OTs to identify occupations important to the client along with detecting perceived change in performance of those occupations over time (Law, Baptiste, McColl, Opzoomer, Polatajko, & Pollock, 1990). Kassbert, Prellwitz, Malinowsky, and Larsson-Lund (2016) used the COPM to identify and prioritize occupations included in the use of everyday technology to develop client-centered occupational therapy interventions to improve task completion. In addition, Edgar et al. (2017) utilized a cross-sectional design to survey community-living adults with strokes on their experiences with technology and level of desire to use technology for rehabilitation. The participants completed surveys for demographics, stroke severity, and communication technology (Edgar et al., 2017). The final sample of 102 participants included 58 males and 44 females with a mean age of 67.6 years old and a mean of eight years since their last stroke (Edgar et al., 2017). Sixty-one percent of the participants reported interest in education through technology, which would increase their ability to receive therapy services since 48% of the participants reported some difficulty accessing rehabilitation services (Edgar et al., 2017). Another study by Arthanat et al. (2016) used a mixed methods approach with both quantitative and qualitative components to determine the effectiveness of client-specific technology training and the participants' perceived value of the older adults' use of information communication technology in the home. They found a statistically significant ($\chi^2 = 11.4$, $p = 0.04$, and $df = 5$) increase in total technology activities across time with the most significant increase in the average number of leisure activities ($\chi^2 = 22.6$, $p = 0.0$, and df

= 5) and a non-statistically significant increase in health management ($x^2 = 6.0$, $p = 0.3$, and $df = 5$) (Arthanat et al., 2016). The increase in clients using technology for health management after client-specific training for iPad use is clinically significant as any improvement in personal health management may result in overall better quality of life. Perceptions improved significantly from negative to positive in the area of satisfaction with technology ($x^2 = 16.5$, $p = 0.006$, and $df = 5$) and comfort with technology ($x^2 = 22.6$, $p = 0.0$, and $df = 5$) (Arthanat et al., 2016). Overall, the participants reported improved confidence with using technology for leisure activities, social participation, and accessing important information, which validates the need for individualized instruction to older adults on how to use technology effectively (Arthanat et al., 2016).

Educate Students to Determine Older Adults' Preferred Learning Style and Modify Training Methods to Meet Their Needs

OT instructors should also educate students to determine older adults' preferred learning styles in preparation for using technology. Arthanat et al. (2016), emphasized the importance of assessing the learning styles of the client before proceeding with any technological education training, but the researchers did not specify a learning style inventory. Instead, the authors simply asked the clients if they preferred multiple training strategies, reading instructions, verbal instructions, demonstrated tasks, or practicing the tasks (Arthanat et al., 2016). Schmidt and Camacho (2014) utilized Kolb's Learning Style Inventory to determine clients' preferred learning styles. Kolb (1984) identified four learning styles including convergers (learn through practice of one specific technique), divergers (learn through observation and brainstorming), assimilators (learn through lecture and demonstrations), and accommodators (learn by doing). Schmidt and Camacho implemented a pre-prosthetic training protocol with specific teaching techniques based on clients' learning styles. They presented a case study using the protocol and teaching techniques based on the identified learning styles. Clinicians should vary the method of teaching based on the needed skills and the clients' preferred learning styles keeping in mind most people will have a blend of several learning styles (Schmidt & Camacho, 2014). OT educators should provide training to students in the assessment and application of learning styles to enhance client understanding.

Teach Students to Assess Health Literacy and to Modify Instructions to Accommodate Low Health Literacy in a Majority of Older Adults

In addition to learning styles, another aspect to consider is the health literacy of clients to ensure there is adequate training and support for the recommended technology (Banbury et al., 2014). Many healthcare professionals provide written educational materials to clients, but they do not take into account the clients' reading level or health literacy (Banbury et al., 2014). The United States Department of Health and Human Services (2000) and Healthy People 2010 describe health literacy as the ability to comprehend basic health information required to make decisions regarding their healthcare. The 2003 National Assessment of Adult Literacy, administered to more than 19,000 adults, measured literacy through various health tasks (Kutner, Greenberg, Jin, & Paulsen, 2006). They reported 36% of the adults surveyed had basic or below basic literacy levels meaning they could not read and understand unfamiliar, complex, or abstract documents (Kutner et al., 2006). Interestingly, 59% of adults over the age of

65 had basic or below basic literacy levels indicating the need for occupational therapists who work with older adults to modify educational materials to a very simple reading level and not assume clients can read and understand documents (Kutner et al., 2006). To overcome the disparity in health literacy levels, Banbury et al. (2014) utilized a qualitative, descriptive design to explore the lived experiences of 52 older adults using a multi-site videoconferencing educational program. Researchers concluded older adults could successfully use telehealth if they were provided with the proper supports and training (Banbury et al., 2014). A highly marketable aspect of this video technology includes clients who were unable to read reported the ability to participate and learn new information in this educational program (Banbury et al., 2014). The participants also reported benefits of feeling more relaxed, the convenience of not having to arrange transportation, decreased sense of feeling overwhelmed with group education, and seeing other group members' body language and facial expressions (Banbury et al., 2014). In a study by Tilson, Loeb, Barbosa, Jiang, and Lee (2016), thirteen Doctor of Physical Therapy (DPT) students utilized technology to increase older adults' health literacy and ability to participate in daily occupations by utilizing iPads to complete patient education 140 times or 18.2% in 691 days of clinical experiences. Students instructed clients on movement, posture, exercises, anatomy, and neurological symptoms using a variety of applications including the camera, muscle system pro III, VI Golf, Safari, HEP2go, Muscle System Pro, DrawMD, and Biomet Virtual Bone Model (Tilson et al., 2016). Researchers found students utilized technology for a variety of interventions after instruction on appropriate applications to use with older adults (Tilson et al., 2016). Based on evidence in these articles, OT instructors should ensure students understand how to modify instructions to accommodate low health literacy in a majority of older adults.

Instruct Students to Educate Older Adults on the Benefits of Technology, but Keep in Mind They May Not Always Be Receptive

It is important for OT instructors to emphasize to students the necessity of providing education to older adult clients on the benefits of utilizing technology in therapy, but they may not always be receptive to using technology for education, assessments, or exercise purposes (Edgar et al., 2017). Older adults need encouragement to use technology independently as their perceptions of independence may not change over time (Arthanat et al., 2016). In order for older adults to engage fully in the interventions using technology, therapists should educate them on the ways technology improves their quality of life through improved interaction with others, decreased isolation, and the improved ability to live on their own (Vaportzis, Clausen, & Gow, 2017). Emphasis on the benefits of the client-specific technology along with the goals of the exercise or activity program will increase older adult compliance (Lemoncello, Sohlberg, Fickas, Albin, & Harn, 2011; Vaportzis et al., 2017). Therapists should also address any fears of decreased quality of care and decreased social interactions when using technology (Edgar et al., 2017). Thirty-nine percent of the older adult participants in the Edgar et al. study (2017) reported no interest in receiving services using technology, which means the OT should choose another method to provide the educational components of treatment.

Instruct Students to Simplify Instructions about Technology and Utilize Familiar Technology for Best Compliance with Older Adults

Students must learn how to simplify instructions for older adults, especially when initially introducing technology, rather than assuming older adults already possess the baseline knowledge to operate the device (Vaportzis et al., 2017). Vaportzis et al. (2017) completed a qualitative study examining healthy older adults' initial perceptions, familiarity, and reported barriers to use of web-based tablets. The researchers explored the attitudes about general technology and older adults' potential use of tablets (Vaportzis et al., 2017). The investigators suggested older adults would increase their tablet use if they felt more competent in using the technology (Vaportzis et al., 2017). Schneider and Howard (2017) reported a key way to help clients feel competent is to divide the educational information into several different sessions to improve compliance and decrease clients feeling overwhelmed. Schneider and Howard (2017) completed a non-randomized controlled cohort study to compare coping scores between a standard discharge group and a technology group of older adult clients who were recovering from strokes. The investigators provided the technology group with discharge education involving scripted messages, secure emails, and access to an online portal (Schneider & Howard, 2017). The researchers reported a significantly higher ($p < 0.0001$) coping score in the technology group than the standard group on the Post-Discharge Coping Scale, which they attributed to clinicians dividing the education into several messages rather than overloading patients with too much information all at once (Schneider & Howard, 2017).

Clinicians should also consider intervention options for educating older adults using familiar technology, such as iPads, email, texting, and smart phone applications to increase receptiveness and understanding of use of technology (Cook et al., 2014; Edgar et al., 2017). Cook et al. (2014) completed a cohort study of 149 older adult inpatients to assess the effectiveness of older adult client education using iPads. The researchers reported participants completed 84% of the educational content over five and half days of in-patient hospital stay and 90% of them reported understanding the content (Cook et al., 2014). The authors found many older adults could utilize an iPad to learn content presented in a user-friendly manner, and the iPad provided consistent, current information to appeal to a variety of learners (Cook et al., 2014).

Instruct Students to Utilize Adult Learning Strategies and Problem-Centered Learning to Teach Older Adults about Technology

Occupational therapy instructors should include education to entry-level OT students on adult learning strategies that are problem-centered and focused on immediate use of the knowledge (Merriam, 2001). The adult learner is characterized by someone who has an independent self-concept and can direct their own learning motivated by internal factors (Merriam, 2001). Adult learners have life experiences and learning needs related to evolving roles in life. Occupational therapy students need to understand they must involve older adults in the learning process by frequently asking for feedback and suggestions along with providing ample time for them to feel competent (Arthanat et al., 2016; Vaportzis et al., 2017). According to Sawyer et al. (2016), client education using technology-based communication to manage chronic illness promotes self-paced and

self-directed learning, which is a key component for adult learning. Clinicians need to nurture the elements influencing improved adult learning including responsibility for one's own learning, motivation to learn, and problem-centered learning with real-life issues (Merriam, 2001; Mitchell & Courtney, 2005). Another way to help older adults feel competent with new technology is to facilitate hands-on learning opportunities to practice new skills with direct feedback from therapists (Arthanat et al., 2016). OT students should learn ways to provide this feedback to clients in a calm, professional manner.

Teach Students to Ensure Their Older Adult Clients Are Capable Of Contacting Them Using Technology

Instructors should teach students to provide adequate discharge information to their clients including providing text or email contact information to help older adults feel connected, and give them an opportunity to ask questions after the allocated training time (Schneider & Howard, 2017). Lemoncello et al. (2011) completed a Phase I, single subject, alternating treatment, experimental design study, in which they repeated measures within participants to evaluate whether clients would have improved compliance with home exercise programs using technology or traditional interventions. The technology used a computer system attached to the television to remind participants on the benefits and goals of exercise while using customized video demonstrations with reminders to initiate exercises (Lemoncello et al., 2011). Results using Cohen's d to compare the mean scores in each participant across the different treatment conditions, indicated a large treatment effect in two of the three participants ($d = 1.49$ and $d = 1.59$). The third participant had a small treatment effect ($d = 0.13$), possibly due to high motivation throughout the program; this patient reported willingness to perform the exercises regardless of educational techniques. All participants reported the use of technology helped to increase frequency and accuracy of exercises as well as helped them rely less on caregivers for exercise prompts (Lemoncello et al., 2011). Researchers recommended providing scripted reminders using texting or smart phone applications to improve compliance with home exercises (Lemoncello et al., 2011; Schneider & Howard, 2017). Therapists should continue to educate clients on the benefits of continued compliance with exercises and activities as part of a home exercise program, which helps clients maintain a higher level of independence over time with less acute hospital stays (Bendixen, Levy, Olive, Kobb, & Mann, 2009). Table 1 shows example assignments that could be used to teach OT students each of the strategies outlined above.

Table 1

Sample Student Learning Objectives, Assignments, and Supporting Evidence for Each Strategy

Strategy	Sample Student Learning Objective	Sample Assignment	Supporting Evidence
Instruct students how to assess clients' priorities and desire to use technology.	Students will create and implement an educational group for older adults using videoconference technology.	Students will design a videoconference education group with at least three participants in different locations. Students must complete the COPM on three participants to assess clients' priorities and desires to use technology prior to assigning them to the group. Students will demonstrate the group intervention using live videoconference with participants in at least three different locations.	Arthanat et al., 2016; Edgar et al., 2017; Kassbert et al., 2016
Educate students to determine older adults' preferred learning style and modify training methods to meet their needs.	Students will assess a client's learning style and demonstrate training methods that reflect understanding of the client's preferred learning style when implementing a telehealth visit.	Students will instruct a client on activity modifications in the home via telehealth technology. Students will submit a detailed plan of the visit including assessment of learning style. The submission will also include a video of a completed telehealth visit for a simulated client.	Arthanat et al., 2016; Kolb, 1984; Schmidt & Camacho, 2014
Teach students to assess health literacy and to modify instructions to accommodate low health literacy in a majority of older adults.	Students will assess a client's health literacy and modify teaching strategies to accommodate for low literacy levels while utilizing technology to educate a client on the importance of medication management.	Students will submit a description of the client's health literacy selected technology for education, and a detailed plan for instruction.	Banbury et al., 2014; Kutner et al., 2006; Tilson et al., 2016

<p>Instruct students to educate older adults on the benefits of technology, but keep in mind they may not always be receptive.</p>	<p>Students will complete a community-based program proposal using technology to improve access to educational resources.</p>	<p>Students will complete a forum post explaining ways to use technology in the community to address unmet mental health needs. The forum post should include specific ways the student will educate clients on the benefits of technology including ways it will improve the clients' quality of life through improved interaction with others, decreased isolation, and improved ability to live on their own. Students must also educate clients on the benefits and goals of the exercise or activity program to increase compliance.</p>	<p>Arthanat et al., 2016; Edgar et al., 2017; Lemoncello et al., 2011; Vaportzis et al., 2017</p>
<p>Instruct students to simplify instructions about technology and utilize familiar technology for best compliance with older adults.</p>	<p>Students will utilize familiar technology to instruct older adult clients on diagnosis, precautions, anatomy, and/or treatment options.</p>	<p>Students will submit a video of an intervention using a smart phone or tablet with a simulated client educating on relevant information of the assigned diagnosis. Instruction must include education on basic use of technology, short sessions with divided information so as not to overwhelm the client, and must allow adequate time to allow questions from the client.</p>	<p>Cook et al., 2014; Edgar et al., 2017; Schneider & Howard, 2017; Vaportzis et al., 2017</p>
<p>Instruct students to utilize adult learning strategies and problem-centered learning to teach older adults about technology.</p>	<p>Student will demonstrate understanding of adult learning strategies and problem-centered instructional techniques while teaching an older adult to use new technology in their home.</p>	<p>Students will submit a home assessment with recommendations using smart technology to improve safety in the home. Students must detail how they will instruct clients on the use of recommended devices using adult learning strategies.</p>	<p>Arthanat et al., 2016; Merriam, 2001; Mitchell & Courtney, 2005; Sawyer, et al., 2016; Vaportzis et al., 2017</p>

Teach students to ensure their older adult clients are capable of contacting them using technology.	Student will demonstrate understanding of using familiar technology to make sure clients can contact them for questions.	Students will submit follow-up education to a client using a list of short messages in text or email format depending on client preference providing an easy way for clients to contact them with questions.	Bendixen et al., 2009; Lemoncello et al., 2011; Schneider & Howard, 2017
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DISCUSSION AND IMPLICATIONS FOR OCCUPATIONAL THERAPY EDUCATION

The intent of this paper was to provide OT educators with recommendations for teaching entry-level students to use evidence-based technology with older adults. Teaching students to use technology with older adults may have a lasting effect on the older adults' health and well-being. Through educating older adults on the use of technology to help with compliance of home programs, therapists are addressing performance skills and patterns within the client's virtual context and environment to maximize their occupational performance (AOTA, 2014). Therapists should utilize technologies as a component of a comprehensive OT plan to best address clients' performance patterns and skills by using critical thinking skills to address physical, social, cognitive, psychological, and environmental contexts (AOTA, 2010b). Cason (2012) identified several barriers to integrating technology into current treatment, but she emphasized the need to overcome those barriers through education and increased awareness of technology along with the inclusion in OT curriculum.

The Accreditation Council for Occupational Therapy Education (ACOTE) standards mandate instruction on the use of technology to support occupational performance for entry-level OT programs. One standard requires students at all levels of OT education to demonstrate competence using "technology to support performance, participation, health, and well-being" (Standard B.1.8; ACOTE, 2018, p. 19). Another ACOTE standard states entry-level practitioners need to be able select and teach compensatory strategies including the use of technology to "support performance, participation, and well-being" (Standard B.5.24; ACOTE, 2018, p.27). Existing OT curricula likely meet these standards in a variety of ways, and instructors must determine how to best address the assigned standards and design specific course work to meet them. But educators may not have considered pairing these accreditation standards with the technology needs of older adults. When OT faculty implement the recommendations for integrating evidence-based technology for older adults presented here, the assignments may be used as evidence of compliance with ACOTE standards across the lifespan.

The Blueprint for Entry-Level Education (Blueprint) by the AOTA (2010a) describes content OT faculty should include in OT programs as a guide for educators to prepare students to address future needs of society. The *Blueprint* identifies the "use of virtual tools" as a skill instructors should include in entry-level OT education in all person-

centered and environment-centered factors (AOTA, 2010a, pp. 188-190). While the *Blueprint* provides a template of content to include in OT curriculum, it does not provide specific details about how to incorporate the content into courses. Another pertinent document is “Specialized Knowledge and Skills in Technology and Environmental Interventions for Occupational Therapy Practice” (AOTA, 2010b), which provides a list of skills entry-level practitioners should be competent in performing. The document emphasizes OT instructors should prepare students to assess the client’s abilities and environment to make appropriate recommendations for application of new or existing technologies to support daily life occupations, but it does not provide specific instructional content.

With continually emerging technology, OT instructors may demonstrate the scholarship of teaching and learning by increasing their awareness of technology applications and educational programs used for client education and translate knowledge to their students (AOTA, 2009). OT instructors may use the suggestions for evidence-based assignments and assessments to add technology content to established OT courses. The addition of these suggestions will ensure students are competent and knowledgeable in using technology as an integrated part of clinical practice in educating older adults.

CONCLUSION

There is clear evidence to support the use of technology in the clinical education of older adults. However, there is a lack of clear, practical suggestions for integration of technology using evidence-based interventions for older adults into OT courses. This article proposed recommendations for teaching entry-level students to use evidence-based technology with older adults. Clearly defined and specific ideas for integrating technology for older adult interventions incorporating recent evidence will help OT faculty develop curriculum for entry-level students. It is imperative OT educators teach students how to use technology in client education to help ensure OT remains relevant and demonstrates acceptance of the mandate of integrating technology into occupation-based interventions to help meet AOTA’s *Vision 2025* (AOTA, 2017).

References

- Accreditation Council for Occupational Therapy Education. (2018). *2011 Accreditation Council for Occupational Therapy Education (ACOTE®) standards and interpretive guide. August 2018 interpretive guide version*. Retrieved from <https://www.aota.org/~media/Corporate/Files/EducationCareers/Accredit/Standards/2011-Standards-and-Interpretive-Guide.pdf>
- American Occupational Therapy Association. (2009). Scholarship in occupational therapy. *American Journal of Occupational Therapy*, 63(6), 790-796. <https://doi.org/10.5014/ajot.63.6.790>
- American Occupational Therapy Association (2010a). Blueprint for entry-level education, *American Journal of Occupational Therapy*, 64, 186-203. <https://doi.org/10.5014/ajot.64.1.186>

- American Occupational Therapy Association. (2010b). Specialized knowledge and skills in technology and environmental interventions for occupational therapy practice. *American Journal of Occupational Therapy*, 64(6), S44–S56. <https://doi.org/10.5014/ajot.2010.64S44>
- American Occupational Therapy Association. (2010c). Telerehabilitation. *American Journal of Occupational Therapy*, 64(Suppl. 6), S92-S102. <https://doi.org/10.5014/ajot.2010.64S92>
- American Occupational Therapy Association. (2014). Occupational therapy practice framework: Domain & process (3rd ed.). *American Journal of Occupational Therapy*, 68(Suppl. 1), s2-s48. <https://doi.org/10.5014/ajot.2014.682006>
- American Occupational Therapy Association. (2017). Vision 2025. *American Journal of Occupational Therapy*, 71, 7103420010. <https://doi.org/10.5014/ajot.2017.713002>
- Arthanat, S., Vroman, K. G., & Lysack, C. (2016). A home-based individualized information communication technology training program for older adults: A demonstration of effectiveness and value. *Disability Rehabilitation Assistive Technology*, 11(4), 316-324. <https://doi.org/10.3109/17483107.2014.974219>
- Banbury, A., Parkinson, L., Nancarrow, S., Dart, J., Gray, L., & Buckley, J. (2014). Multi-site videoconferencing for home-based education of older people with chronic conditions: The telehealth literacy project. *Journal of Telemedicine and Telecare*, 20(7), 353-359. <https://doi.org/10.1177/1357633X14552369>
- Bendixen, R. M., Levy, C. E., Olive, E. S., Kobb, R. F., & Mann, W. C. (2009). Cost effectiveness of a telerehabilitation program to support chronically ill and disabled elders in their homes. *Telemedicine Journal and e-Health*, 15(1), 31-38. <https://doi.org/10.1089/tmj.2008.0046>
- Cason, J. (2012). Telehealth opportunities in occupational therapy through the Affordable Care Act. *American Journal of Occupational Therapy*, 66(2), 5. <https://doi.org/10.5014/ajot.2012.662001>
- Chaffin, A. J., & Harlow, S.D. (2005). Cognitive learning applied to older adult learners and technology. *Educational Gerontology*, 31, 301-329. <https://doi.org/10.1080/03601270590916803>
- Choi, N. (2011). Relationship between health service use and health information technology use among older adults: Analysis of the US National Health Interview Survey. *Journal of medical Internet research*, 13(2), e33. <https://doi.org/10.2196/jmir.1753>
- Cook, D. J., Moradkhani, A., Douglas, K. V., Prinsen, S. K., Fischer, E. N., & Schroeder, D. R. (2014). Patient education self-management during surgical recovery: Combining mobile (iPad) and a content management system. *Telemedicine and E-Health*, 20(4), 312-317. <https://doi.org/10.1089/tmj.2013.0219>
- Edgar, M. C., Monsees, S., Rhebergen, J., Waring, J., Van der Star, T., Eng, J. J., & Sakakibara, B. M. (2017). Telerehabilitation in stroke recovery: A survey on access and willingness to use low-cost consumer technologies. *Telemedicine Journal and E-Health: The Official Journal of the American Telemedicine Association*, 23(5), 421-429. <https://doi.org/10.1089/tmj.2016.0129>

- Gee, B. M., Salazar, L., Porter, J., Clark, C., & Peterson, T. W. (2017). Overview of instructional technology used in the education of occupational therapy students: A survey study. *Open Journal of Occupational Therapy*, 5(4).
<https://doi.org/10.15453/2168-6408.1352>
- Gitlow, L. (2014). Technology use by older adults and barriers to using technology. *Physical & Occupational Therapy in Geriatrics*, 32(3), 271-280.
<https://doi.org/10.3109/02703181.2014.946640>
- Goodrich, B., & Garza, E. (2015). The role of occupational therapy in providing assistive technology devices and services. Retrieved from <https://www.aota.org/About-Occupational-Therapy/Professionals/RDP/assistive-technology.aspx>
- Heart, T., & Kalderon, E. (2013). Older adults: Are they ready to adopt health-related ICT? *International Journal of Medical Informatics*, 82 (11), e209-e231.
<https://doi.org/10.1016/j.ijmedinf.2011.03.002>
- Hills, C., Ryan, S., Smith, D. R., & Warren-Forward, H. (2012). The impact of 'Generation Y' occupational therapy students on practice education. *Australian Occupational Therapy Journal*, 59(2), 156-163.
<https://doi.org/10.1111/j.1440-1630.2011.00984.x>
- Kassbert, A. C., Prellwitz, M., Malinowsky, C., & Larsson-Lund, M. (2016). Interventions aimed at improving the ability to use everyday technology in work after brain injury. *Scandinavian Journal of Occupational Therapy*, 23(2), 147-157.
<https://doi.org/10.3109/11038128.2015.1122835>
- Kolb, D. A. (1984). *Experimental learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice-Hall
- Kutner, M., Greenberg, E., Jin, Y., & Paulsen, C. (2006). *The health literacy of America's adults: Results from the 2003 national assessment of adult literacy (NCES 2006-483)*. Retrieved from <https://files.eric.ed.gov/fulltext/ED493284.pdf>
- Law, M., Baptiste, S., McColl, M., Opzoomer, A., Polatajko, H., & Pollock, N. (1990). The Canadian occupational performance measure: An outcome measure for occupational therapy. *Canadian Journal of Occupational Therapy*, 57(2), 82-87.
<https://doi.org/10.1177/000841749005700207>
- Lemoncello, R., Sohlberg, M. M., Fickas, S., Albin, R., & Harn, B. E. (2011). Phase I evaluation of the television assisted prompting system to increase completion of home exercises among stroke survivors. *Disability and Rehabilitation: Assistive Technology*, 6(5), 440-452. <https://doi.org/10.3109/17483107.2010.542571>
- Merriam, S. (2001). Andragogy and self-directed learning: Pillars of adult learning theory. *New Directions for Adult and Continuing Education*, 89, p. 1-13.
<https://doi.org/10.1002/ace.3>
- Mitchell, M.L., & Courtney, M. (2005). Improving transfer from intensive care unit: The development, implementation and evaluation of a brochure based on Knowles' adult learning theory. *International Journal of Nursing Practice*, 11(6), 257-268.
<https://doi.org/10.1111/j.1440-172X.2005.00533.x>
- Sawyer, T., Nelson, M. J., McKee, V., Bowers, M. T., Meggitt, C., Baxt, S. K., . . . Granger, B. B. (2016). Implementing electronic tablet-based education of acute care patients. *Critical Care Nurse*, 36(1), 60-70.
<https://doi.org/10.4037/ccn2016541>

- Schmidt, M. R., & Camacho, V. M. (2014). Gauging learning styles: A pre-prosthetic training protocol for older adults with lower limb amputations. *OT Practice Magazine*, 19(1), 14-18. <https://doi.org/10.7138/otp.2014.1901f2>
- Schneider, M. A., & Howard, K. A. (2017). Using technology to enhance discharge teaching and improve coping for patients after stroke. *Journal of Neuroscience Nursing*, 49(3), 152-156. <https://doi.org/10.1097/JNN.0000000000000275>
- Smith, R. (2017). Technology and occupation: Past, present, and the next 100 years of theory and practice. *American Journal of Occupational Therapy*, 71(6), 7106150010p1-7106150010p15. <https://doi.org/10.5014/ajot.2017.716003>
- Tilson, J. K., Loeb, K., Barbosa, S., Jiang, F., & Lee, K. T. (2016). Use of tablet computers to promote physical therapy students' engagement in knowledge translation during clinical experiences. *Journal of Neurologic Physical Therapy*, 40(2), 81-89. <https://doi.org/10.1097/NPT.0000000000000123>
- U.S. Department of Health and Human Services. (2000). *Healthy People 2010: Understanding and Improving Health*. Washington, DC: U.S. Government Printing Office
- Vaportzis, E., Clausen, M. G., & Gow, A. J. (2017). Older adults' perceptions of technology and barriers to interacting with tablet computers: A focus group study. *Frontiers in Psychology*, 8(1687), 1-11. <https://doi.org/10.3389/fpsyg.2017.01687>
- Vroman, K. G., Arthanat, S., & Lysack, C. (2015). "Who over 65 is online?" Older adults' dispositions toward information communication technology. *Computers in Human Behavior*, 43, 156-166. <https://doi.org/10.1016/j.chb.2014.10.018>
- Wallace, S. E., Graham, C., & Saraceno, A. (2013). Older adults' use of technology. *Perspectives on Gerontology*, 18(2), 50-59. <https://doi.org/10.1044/gero18.2.50>
- Zickuhr, K., & Madden, M. (2012). Older adults and internet use. *Pew Research Center*. Retrieved from <https://www.pewinternet.org/2012/06/06/older-adults-and-internet-use/>